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NEW TECHNIQUES

NEW PRODUCTS

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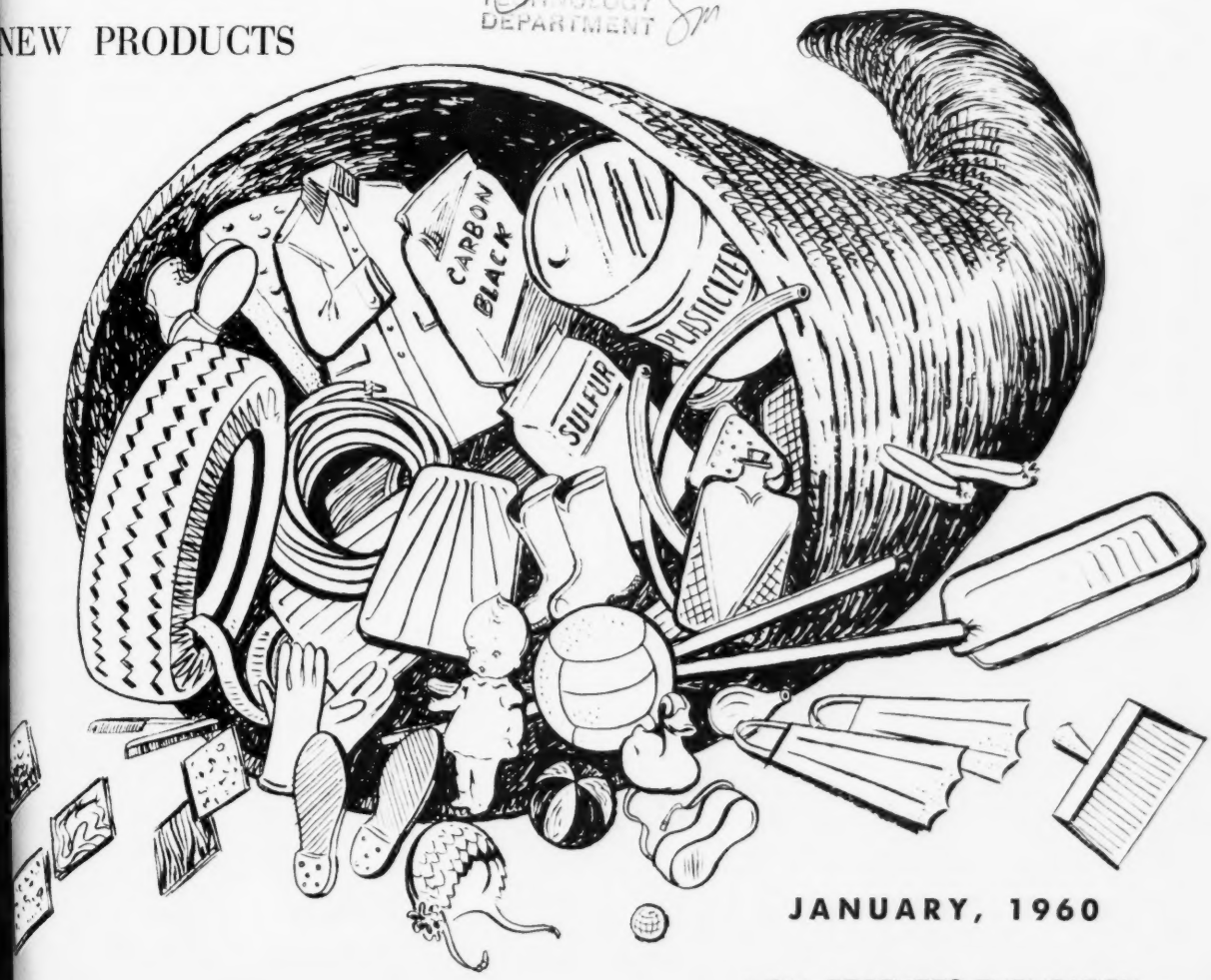

JANUARY, 1960

A BILL BROTHERS PUBLICATION

From Du Pont

HELIOZONE

...for all-season surface protection of elastomers

HELIOZONE is a blend of waxes specially designed to migrate slowly to the surface of rubber products, giving them a screen of protection from the effects of sunlight.

HELIOZONE, along with other Du Pont rubber chemicals*, will now come to you in a corrugated paperboard carton, 50 pounds net weight.

The new package...

Reduces storage space—25% more material can be stored in the same area.

Is easier to handle—50-pound cartons can be easily moved by hand if necessary.

Reduces opportunity for contamination—only a small quantity is exposed to the atmosphere at any one time.

For more complete information about **HELIOZONE** contact your nearest Elastomer Chemicals Department District Office.

**These chemicals are:*

THIONEX • THIONEX GRAINS • THIURAM M
THIURAM M GRAINS • RPA No. 2 • ALL COLORS

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RUBBER CHEMICALS

Better Things for Better Living . . . *through Chemistry*

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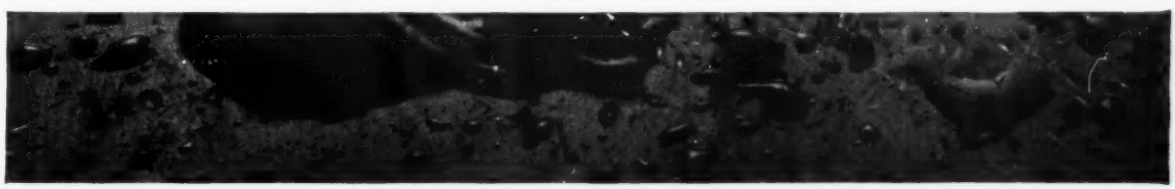
News about

B.F.Goodrich Chemical *raw materials*

HYCAR 1002



Even after years of research and development, there is no substitute for the excellent water resistance contributed by one of the original nitrile polymers, Hycar 1002. This unusually clean rubber proves ideal in applications where water may be a problem.

Hycar 1002 contributes other important properties, too, producing excellent stiffness without extra loading in the uncured state. It is an excellent polymer for use in extruded products or sponge—anywhere that stiffness during cure is important.

In addition, Hycar 1002 is often the answer to improving the qualities of SBR rubber at low cost. It is compatible with most all rubbers, vinyl and phenolic resins.

And of course, Hycar 1002 supplies the properties users have come to expect from nitrile rubbers—heat resistance, abrasion resistance and solvent resistance. It's an example of lasting development in nitrile rubber to meet your compounding needs. Get information about 1002 or other Hycar rubbers by writing Dept. FB-1, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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RUBBER DIVISION MEETING
Los Angeles: May 13, 14 and 15

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RUBBER WORLD

ARTICLE HIGHLIGHTS

FOOD ADDITIVES LAW DEADLINE MUST BE DELAYED

Rubber product manufacturers are finding it very difficult to meet deadline for Food & Drug Administration approval of rubber compounds destined for use in contact with foods. A delay is essential if undue confusion is not to result. **513**

PLANNING EXPERIMENTS SHOWN TO BE USEFUL

A modification of the classical Edisonian approach to planned experiments is described, using actual rubber tests. This plan differs from the classical, by considering variations of several factors simultaneously rather than one at a time. **515**

SPECIAL COMPOUNDING FOR DIRECT MOLDED SHOES

The establishment of direct molded footwear for many varied types of shoes has resulted in compounds being developed that would have been called "impossibly" scorchy beforehand. **520**

RTV SILICONE RUBBER FOR EPOXY MOLDS

Elimination of metal or other permanent mold materials, when molding or encapsulating epoxy resin systems, by using RTV silicone rubber proves to be highly successful. **526**

MATERIALS AND MACHINES SYMPOSIA HELD

The Southern Rubber Group meeting heard experts discuss "Materials and Process Control" and "Basic Modern Processing Equipment for the Rubber and Plastics Industries." **527**

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VOLUME 141, NUMBER 4 JANUARY, 1960

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The opinions expressed by our contributors do not necessarily reflect those of our editors

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O is for the Original HAF black

(tops in its class for strength and good physical properties.)

Philblack O is used extensively by tire manufacturers because it gives rubber excellent abrasion resistance. Longer flex life, too. And Philblack O compounds have high electrical conductivity. This means that with Philblack O you can get rubber with better physical properties *at a lower cost.*

It will pay you to learn which Philblack will do the best and most economical job in your operation. If you have a rubber problem, Phillips technical service laboratory and Phillips experts in the rubber-carbon black field will be glad to help. Just call your Phillips technical representative for prompt assistance.

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NEWS of the RUBBER WORLD

Rubber Manufacturers Association's president, Ross R. Ormsby, reported at the year's end the following new records that are expected will be established by the rubber industry for 1959: consumption of new rubber, 1,615,000 long tons; of synthetic rubber, more than one million tons; of new rubber in tires and tire products, more than one million tons; and of new rubber in non-tire products, nearly 600,000 tons. Also, more than 1,300,000 tons of synthetic rubber were produced, of which 280,000 tons were exported. Replacement passenger-car tire shipments reached a new peak of 65 million units.

H. E. Humphreys, Jr., chairman of United States Rubber Co., expects rubber industry sales will reach a new high of $6.6 billion in 1960; J. Ward Keener, president of The B. F. Goodrich Co., is optimistic about the physical volume of business in 1960; Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co., thinks we are on the threshold of a 10-year period of unprecedented growth; and William O'Neil, president of General Tire & Rubber Co., forecasts that the industry will record its greatest sales volume in 1960.

The B. F. Goodrich Co. has been granted a patent on safety chambers for use in automobile tires, ending a 10-year legal battle. Goodrich will start production of this type of tire early in 1960.

The Firestone Tire & Rubber Co. has announced plans for the introduction of a premium-quality tire to be made of butyl rubber.

The Food Additives Amendment of the Federal Food, Drug and Cosmetic Act is a major problem to manufacturers of rubber products used in contact with food. A special committee of the RMA is studying ways and means of obtaining approval of many rubber products for such use by March 6, 1960, without which both the rubber and food products industries may be seriously handicapped.

Call Hall

HALLCO NEWS

Issued by
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Chemical Manufacturers

No. 8

LOW TEMPERATURE PLASTICIZER FOR VINYL AND RUBBER

Dioctyl Azelate C-498 is an ester-type technical grade plasticizer, low in volatility and in water extractions. It imparts good light and heat stability and is highly recommended for calendered films, sheets, coated films, dispersions, plastisols and extrusions. Users report that C-498 is an excellent softening agent for synthetic rubbers, especially the nitrile type. C-498 is manufactured by: The C. P. Hall Co.

LOW COST PLASTICIZER AND WETTING AGENT FOR VINYL AND RUBBER

Another quality plasticizer, C-325 is reported to do many jobs at lower cost with smaller amounts needed. It is a primary plasticizer for nitro-cellulose, chlorinated rubber, polystyrene and other synthetics, imparts permanent flexibility. C-325 also is ideal as a secondary softener for many vinyl resins. As a wetting agent for colors and pigments it produces a finer grind, more stable dispersion, and serves as an effective anti-livering agent. For nitrile type rubbers, C-325 is a good low temperature plasticizer, producing compounds that will pass the ASTM Test at temperatures to —65° C. It is manufactured by: The C. P. Hall Co.

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They provide a high softening point and low penetration. Prepared in stainless steel equipment, Synowaxes range in color from light amber to light gray to brown. Acid number is maintained very low, making these waxes almost completely chemically inert.

Melting points up to 400° F. are obtained by highly specialized processes with softening points very close to melting points. This makes them ideal for high temperature applications where flow at temperatures below melting point is not desired.

Additional Features:

- Can be used alone or in combination with other waxes, to enhance their properties.
- Provides permanent lustre finish -- as in rubber or vinyl floor coverings.
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- Provide excellent lubrication properties.
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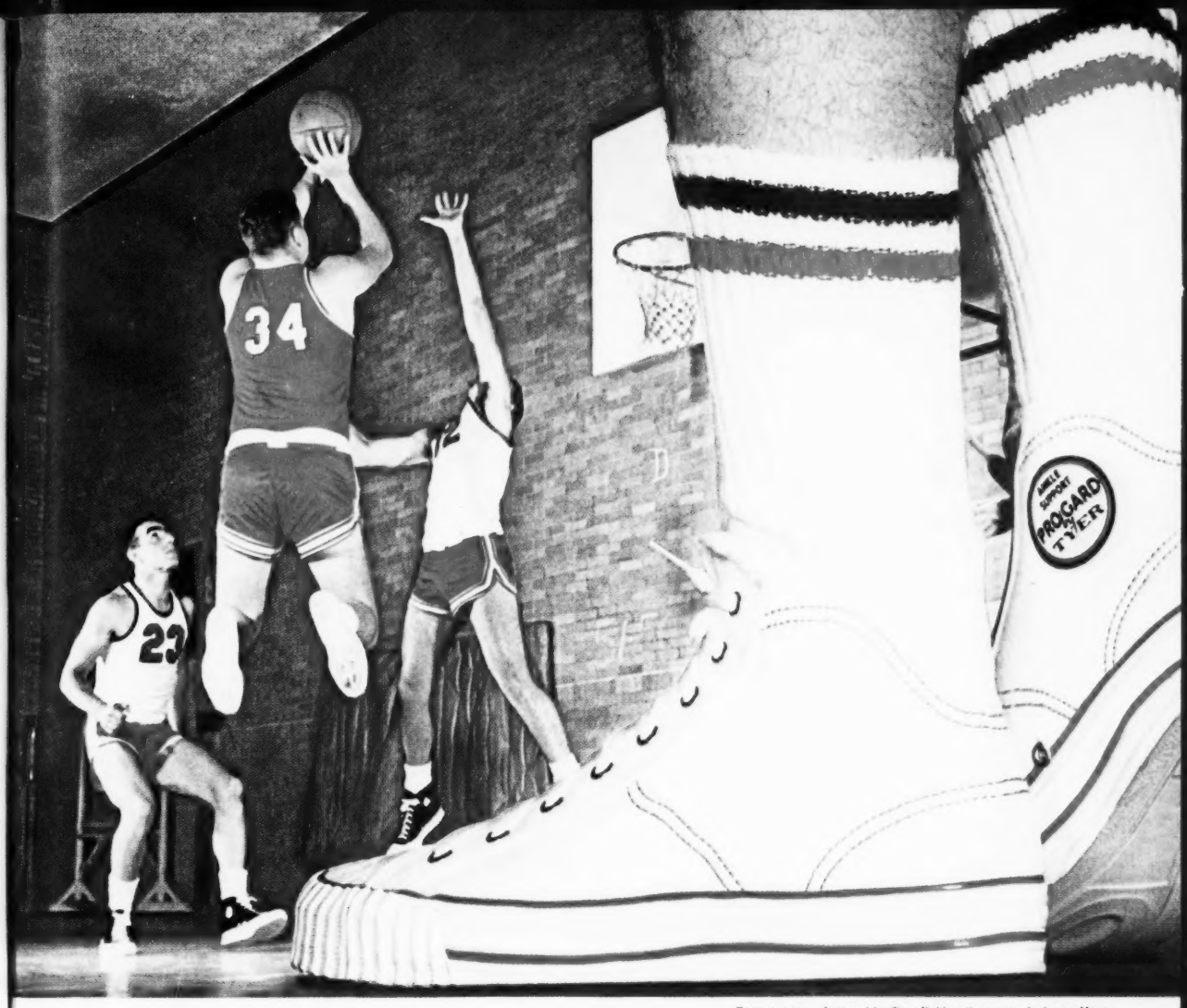


Footwear manufactured by Tyer Rubber Company, Andover, Mass.

How to get the jump on competition

You can't miss with a quality product that's got an exclusive feature of wide appeal. For example, consider the basketball shoes above. They offer everything you'd expect—sure-footed traction, light weight, good resilience, attractive appearance, easy washability—*plus* an "exclusive" that's caught on fast.

This sales-sparking "extra" is a combination ankle support and protective guard that's built right into the shoe. To produce this unique feature, a versatile sponge rubber compound was needed. Chosen: PLIOFLEX—for its unrivaled uniformity and good blowing characteristics.

In other parts of the shoe, PLIOFLEX was used because of its light color and remarkable retention of calendered designs. In the sole, PLIOFLEX provides outstanding nonslip qualities and exceptional flexibility. It also assures better adhesion of rubber to canvas. Throughout the shoe, PLIOFLEX means long wear. And—happily for the manufacturer—PLIOFLEX usually means a substantial reduction in costs.

If you're looking for a compound that can put your product on a better competitive footing, it will pay you to look into PLIOFLEX—now used in more products than any other synthetic rubber. For complete information, write Goodyear, Chemical Division, Dept. M-9418, Akron 16, Ohio.

GOODYEAR

CHEMICAL DIVISION

Pliofiex – T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Photograph taken through the courtesy of Crown Rubber Company, Fremont, Ohio

Out in front, because it's so well-backed —with PLIOLITE LATEX

New in concept is perhaps the best way to describe the handsome floor covering pictured above. The idea is to use it first as temporary carpeting, later as permanent padding under conventional carpeting. It's made of durable woven cotton, permanently bonded to long-lasting foam rubber. The price—pennies per square foot.

A vital part in turning this bright idea into a successful product was played by PLIOLITE LATEX 5352. This new synthetic rubber latex was chosen primarily because it can be used *without* blending with natural rubber latex to make resilient, durable foam. Other reasons for its selection: Outstanding uniformity. Excellent physical properties.

How can PLIOLITE LATEX 5352 help you put your product out in front? You'll find it makes an excellent, economical cushioning for *many* products. Write for details and technical assistance to Goodyear, Chemical Division, Dept. M-9418, Akron 16, Ohio. Or talk to your local latex compounder.

GOODYEAR

CHEMICAL DIVISION

Pliolite—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Choice combination: Plioflex in the package you prefer!

Look closely at the PLIOFLEX packaging materials above and you'll notice that Goodyear has put some important "extras" into their design. Example: PLIOFLEX bags are distinctively marked and color coded for split-second identification, more efficient storage. Inside those 5-ply polyethylene-laminated bags are PLIOFLEX bales which can be talc dusted or wrapped in polyethylene film–depending on your need.

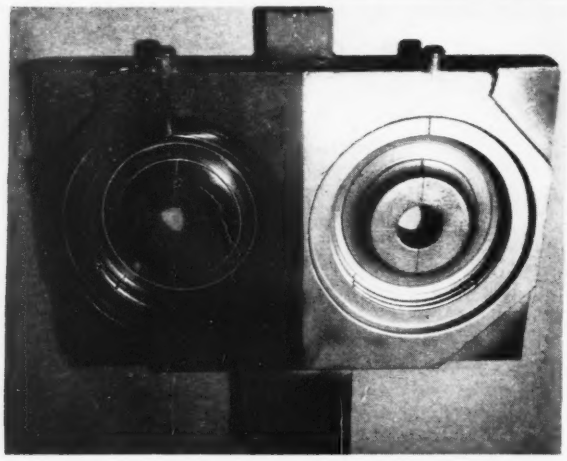
When it comes to shipping, once again–you call it. Bales or bags of PLIOFLEX can be shipped individually or in quantity on nonreturnable, no-charge wooden pallets. Prefer pallets? Palletized shipments come by truck or carload–take your pick. Bulk shipments? They arrive in special *unitized* containers–each one holding 33 film-wrapped bales.

"Seagoing Boxcars" may speed your order from our Houston warehouse. This unique sea-land system assures prompt, economical delivery to Eastern Seaboard customers. *Wherever* you need PLIOFLEX, you'll find it comes safely, swiftly from one of Goodyear's four strategically located supply points. And it comes ideally packaged for your *specific* purpose. More information on PLIOFLEX packaging and product advantages–plus latest *Tech Book Bulletins*–are yours for the asking. Write to: Goodyear, Chemical Division, Dept. M-9418, Akron 16, Ohio.

GOODYEAR
CHEMICAL DIVISION

MARK II

REDUCED THE REJECT RATE AND IMPROVED PRODUCT FINISHES FOR *GATES!*



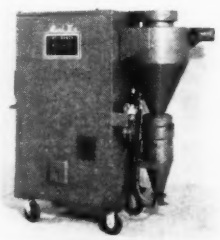
Mold for semi-pneumatic tires at Gates Rubber Company, Denver, Colorado

WHAT IS THE MARK II?

Vacu-Blast's ***Industrial Dry Honer***® model for the molded rubber products industry...the only honing machine that delivers its fine impact cleaning material in a dry air stream. Does a better cleaning job...faster!

Cleaning molds more quickly means slashing your non-productive labor costs...and also reducing non-profit down time on presses.

Molds cleaned more thoroughly, and left with a uniform satin finish, are proven to give a superior final product.



These are just a few of the Mark II Dry Honer's advantages. There are others. Get the full story by writing today for complete specifications literature—to:

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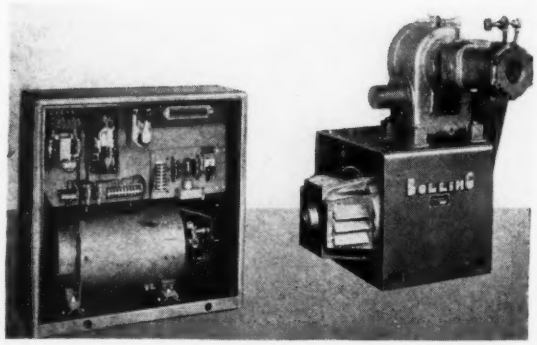

Stewart Bolling motor/generator set *(left)* and extruder

New Stewart Bolling Rubber Extruder

Stewart Bolling & Co., Inc., Cleveland, O., is now offering a 2½-inch extruder for rubber which has some of the same features as the company's plastics extruder. In particular, the reduction unit is common to both machines. It consists of a right-angle gear set with 15:1 ratio having 31 h.p., in AGMA Class 1, with 900 r.p.m. input. A Timken thrust device is integrally mounted in the gear spider, with bearing thrust capacity of 87,000 pounds. All gearing is adequately housed in a cast-iron casing. Nominal capacity up to 200 pounds per hour and a screw speed up to 60 r.p.m. are specified.

The motor/generator set (see cut, *left*) is the same for both machines. A d.c. motor with a variable-speed range of 8:1 is the most widely used type of drive for this size of extruder. Other types of variable-speed drive motors are offered at less cost. The set is housed in a filtered air metal cabinet.

The worm is chrome-plated, hardened alloy steel, with the circulating passage drilled. The effective screw length is 15⅛ inches. The barrel cartridge is cast-steel with spiral circulating passages, the latter fitted with a centrifugally cast X-alloy liner. Barrel assembly includes die head and breaker.

More detailed information is available from the company.

New G-E Kinatrol Speed Drives

A new line of eddy-current coupling adjustable-speed drives, available in ratings from 3 through 100 horsepower, has been announced by General Electric Co., Schenectady, N. Y. The new line, designated Kinatrol, is being offered as a complete packaged drive including the drive unit, control enclosure, and operator's control station. A wide variety of control functions, such as jog, thread, or brake, is available as modifications. The drive is controlled from the operator's station which includes push-buttons and a speed setting dial.

Indicated applications of the speed drives for the rubber and plastics industries are tubers, calenders, extruders, take-ups, and capstans and for single-motor and multi-motor conveyors and large crane hoists in the materials handling field.

The drive unit consists of an integrally mounted induction motor and eddy-current coupling. The input member of the coupling is driven by the induction motor at constant speed. The speed of the output shaft is adjustable over a wide range by controlling the excitation of the coupling field coil.

throughout the world

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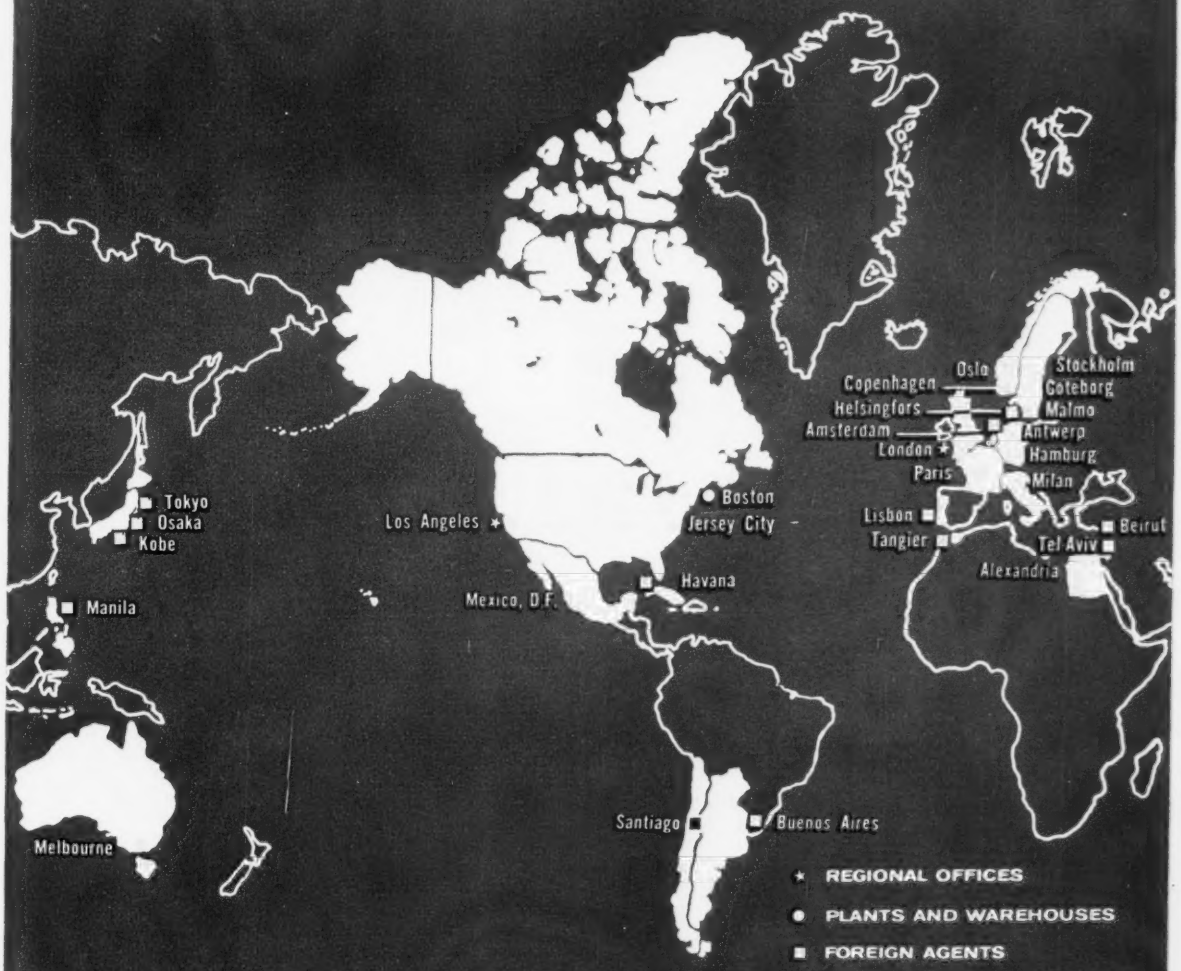

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Maximum Output
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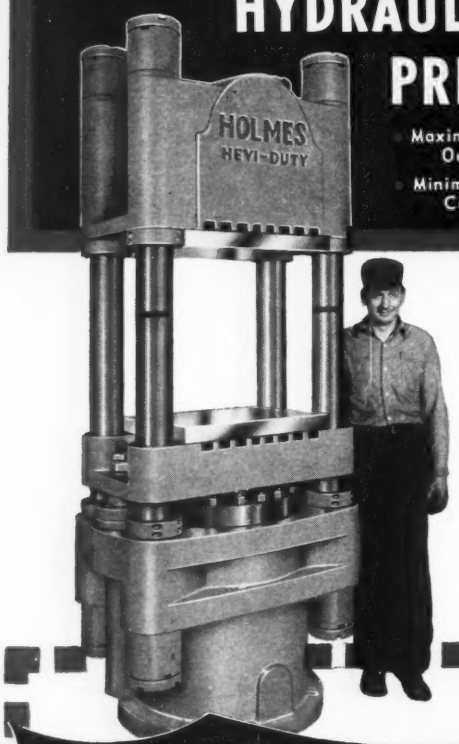

New Features--Precision Results

The new and improved Holmes Hydraulic Press retains all the features of its famous predecessors... PLUS...many outstanding improvements. These put it in a class by itself--for all kinds of general purpose work...and...special production where close tolerance is required. Low in price. Practically no maintenance. Will quickly pay for itself in any processing plant.

WRITE OR WIRE FOR SPECIFIC DETAILS--regardless of your particular requirements. With 52 years know-how specializing in machinery and molds for the rubber industry--Holmes can help you solve your problems, too, just as they have for so many others. No obligation, of course.

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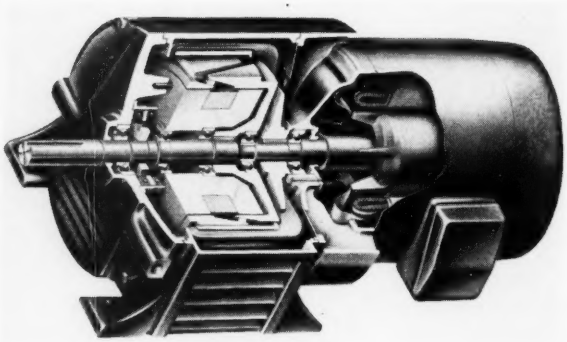


Cutaway of G-E's Kinatrol Drive

Standard drive units include an integrally mounted Tri/Clad induction motor, a stationary-field eddy-current coupling, and an internal permanent-magnet a.c. tachometer generator. Field excitation is supplied by an exciter-regulator for speed regulation.

Drive unit modifications such as integrally mounted gears, eddy-current brakes, and friction brakes are readily available. Dripproof enclosure can be supplied to give added protection against unusually dirty, gritty, or moisture-laden atmospheres.

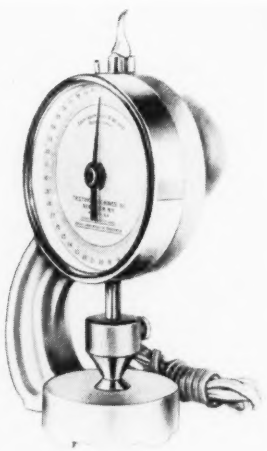
Control enclosure for packaged drive includes exciter-regulator (electronic or amplistat) for coupling control and may also include a.c. motor starter and short circuit protection. Wiring is front-of-board for easy accessibility and enclosure mounting versatility.

All small resistors, capacitors, and rectifier diodes in the exciter-regulator are mounted on a plug-in component board, replaceable in minutes. Replaced board can be repaired by the user. Ample space is provided in the enclosure for addition of wide range of control modifications.

More detailed information is available from the company.

Dead-Weight Motorized Micrometer

More precise thickness measurements of sheet materials is now made possible by a further refinement to the manual dead-weight micrometers produced by Testing Machines, Inc., Mineola, L. I., N. Y. Until now there had been the problem of a spring-operated instrument changing its measuring pressure. The measuring pressure of screw-type micrometers is generally not known. With a hand-operated dead-weight dial micrometer the pressure is unchanging, but the operator can affect the reading by his method of applying the dead-weight load. The new TMI motorized dead-weight precision eliminates these variables, reports the company.



TMI dead-weight micrometer

This new instrument is not hand operated, and the readings are most reproducible and will correlate from operator to operator and from plant to plant, it is claimed. It assures that the dead-weight measuring load is always applied in the same way and with exactly the same psi. pressure.

(Continued on page 482)

5 Easy Steps

to bond rubber-to-metal PERMANENTLY

with

TY-PLY®

TY-PLY "BN"
For bonding nitrile rubbers

TY-PLY "UP-RC"
Two-coat adhesive system for bonding natural rubber and SBR compounds

TY-PLY "UP-BC"
Two-coat adhesive system for bonding butyl rubbers

TY-PLY "S"
For bonding Neoprenes

TY-PLY "Q" or "3640"
The single-coat system for bonding natural and SBR compounds

1. Clean the metal surface by degreasing; then sandblast, pickle, or buff.
2. Wipe the rubber surface with a suitable solvent.
3. Stir MARBON TY-PLY, using whichever type fits your particular application.
4. Apply an even coat of TY-PLY to the cleaned metal surface. Allow to dry.
5. Assemble and cure.

Easy-to-use, low cost TY-PLY—the recognized leader in the rubber-to-metal adhesive field—is the real solution to your bonding problems. Your best buy from every point is one of the TY-PLY adhesives, for use with natural and synthetic base rubbers and neoprene.

Write today for complete information.

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NEW MATERIALS

Epolene LVE, HDE, HD

Development of three new low molecular weight polyethylene resins designed for uses in rubber, coatings, polishes, textile finishes, and in plastic molding and extruson compounds has been announced by Eastman Chemical Products, Inc., Kingsport, Tenn. The new resins, designated Epolene LVE (low viscosity, emulsifiable), HDE (high density, emulsifiable), and HD (high density), are designed to complete the line of Epolene compounds (types E, C, N, and LV). The expanded family of seven resins now offers low molecular weight polyethylene users a wide range of molecular weights (1500-7000), densities (0.902 to 0.956), and viscosities.

Eastman foresees rapid industrial acceptance of the new resins in improving injection molding operations of polyethylene, as an additive to rubber to serve as a calender and mold release agent, as a lubricant in extrusion operations, in textile softeners and sizing agents, as a paraffin modifier, in emulsion-type paper coatings, and in synthetic waxes.

Some typical properties of the new Epolene resins are reported as follows:

	Compound—Epolene		
Property	LVE	HDE	HD
Emulsifiable	yes	yes	no
Density	0.939	0.956	0.938
Approx. molecular wt.	1500	1500	1500
Brookfield Viscosity, cp.			
160° C.	170	160	150
140° C.	250	265	220
120° C.	400	455	340
Penetration hardness, tenths of mm., 100 gm/5 sec. @ 77° F.	5	1	0.5

Epolene LVE has good anti-slip properties and rebuffability when used in floor polish formulations. It is also useful as a softening agent in conjunction with resins used to treat wash-and-wear fabrics, as a sizing agent for textiles, in emulsion paper coatings, and as a paraffin modifier. Epolene HDE deposits an extremely hard film when used in self-polishing floor polish formulations. HD type has potential usage in printing ink applications.

Additional information on these resins is available from the company.

Oakite Cleaning Solutions

Oakite Products, Inc., New York, N. Y., has announced the availability of a number of cleaning compounds to be used in ultrasonic cleaning processes. Typically, ultrasonic cleaning is used mainly in the cleaning of critically exact parts. The kind of soil it can remove depends on the nature of the cleaning solution and covers the whole range of contaminants: oil, grease, smut, buffing compounds, lint, scale, cutting oil, abrasives, etc. It can also be used for descaling and for stripping organic finishes and light rust. The cleaning solution for optimum results is also determined by the type of surface to be cleaned: steel, aluminum, glass, rubber, plastic, etc.

The purpose of ultrasonic cleaning is to step up the efficiency of the cleaning solution in removing soil by wetting out, emulsifying, dissolving, dispersing, or chelating the unwanted material. To get the full benefits of this type of cleaning requires the care-

Release With Real Ease

Sticky Products Won't Stick To Paper with a Syl-off Coating!

Unloading sticky gums, stocks and compounds from shipping containers, storage wrappings and interleaving is no fun when it's a tug of war—it's a costly chore. Manufacturers lose production time and lose money on material left sticking to the wrapper . . . and operators lose their temper.

Now you can be rid of this profit-eating problem. The solution is Syl-off* paper coatings developed by Dow Corning. These new silicone coatings resist sticking better than any other specialty coatings . . . stubborn stickers, such as unvulcanized rubber, latices and pressure-sensitive adhesive masses come clean quickly and easily.

Job Proved. Here's an example that's typical of the effectiveness of these Dow Corning coatings. A well-known company offers camelback on cores coated with Syl-off. Of all core treatments tested, only Syl-off gave completely satisfactory release . . . even after prolonged storage. Retreaders can easily remove *all* the camelback . . . none is left sticking to the core. Syl-off coatings are used with similar success on interleaving, multiwall bag liners, drums, boxboard and many other types of packaging.

How can Syl-off help you? If you ship sticky materials, Syl-off coatings assure your customers of stick-free, waste-free releases . . . provide an important sales advantage. If you receive, handle and process sticky products, you stand to save by specifying Syl-off coatings. You slash unloading time, shorten production time . . . and you throw away only the package — not a bit of the packaged product you've paid for.

In addition, you'll find Syl-off coatings have excellent water and moisture resistance; won't migrate, transfer or contaminate. They often last as long as the paper itself, and their light weight frequently means lower costs when shipping coated paper.

For more information about Syl-off paper coatings and a complete list of approved sources of paper and paperboard made with Syl-off coatings contact any Dow Corning branch office or write Dept. 9101.

* T. M. Dow Corning Corporation

Your nearest Dow Corning office is the number one source for information and technical service on silicones.

first in silicones

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MIDLAND, MICHIGAN

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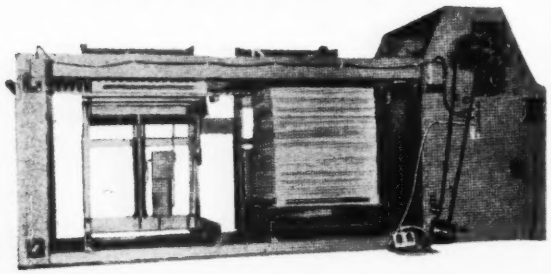
INCREASE PRODUCTION . . . DECREASE COSTS

WITH

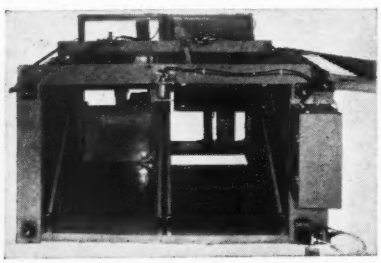
NEW HIGH SPEED

Automatic

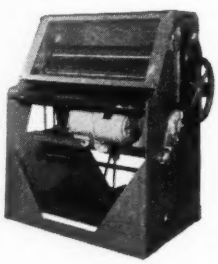
Cutting and Stacking Units



These highly efficient machines are furnished separately or as a complete self-contained unit for automatic cutting and stacking of materials from extruders, mills, calenders, and other processing lines. The Alfa Rotary Cutter is complete with a variable drive for automatic synchronization to the material speed, and length of cut can be easily and infinitely adjusted within the given range. Alfa Stackers are available with single or double stacking units. They accommodate a wide variety of materials and stack on lowering skids that are easily handled by fork truck.



CUTTING and STACKING FEATURES . . .



- Blades easily adjusted to micrometer exactness
- Cuts and stacks at speeds up to and exceeding 100/ft. min.
- Handles material widths from 24" to 50"
- Cuts lengths from 24" to 60"
- Stack per skid 40" high, max. skid load 4000#

SPADONE MACHINE CO. INC.

SOUTH NORWALK, CONN. PHONE: VOlunteer 6-3394
CHICAGO OFFICE: 140 SOUTH CLARK ST. PHONE: CEntral 6-6526
Representative for Alfa Machine Co.

New Materials

ful selection of the proper detergent solution. Oakite has developed a variety of specialized cleaning compounds, some of which follow: Oakite 105—developed expressly for ultrasonic removal of buffing compounds; Oakite 164—specially suited to ultrasonic cleaning of aluminum; Oakite 24—heavy-duty cleaning solution for oily soils; Oakite 33—acidic-detergent scale remover; Oakite Rustripper—for removal of heat scale, rust, smut from steel, and stripping organic finishes; Oakite Saturol—solvent solution for removing burned-on carbon.

Service Bulletin No. 16A, "How To Get the Most out of Ultrasonic Cleaning," is available from the Manufacturer, Oakite Products, Inc.

New K-1347, K-1357 Silicone Rubbers

Silicones division, Union Carbide Corp., New York, N. Y., is now offering two new types of low shrink silicone rubber stock for cable and wire insulation. The first is "Union Carbide" K-1347 Silicone Rubber Compound, a premium-grade material with superior physical and electrical properties for high-quality wire and cable insulation, under conditions of exposure to extreme hot and cold temperatures. It can be continuously vulcanized at the wire factory on conventional equipment, with either steam or hot air. It is supplied in sheet form in 25- and 50-pound cartons.

The second new material is "Union Carbide" K-1357 Silicone Rubber Compound, which is available in coiled strips for direct feed to the extruder. It can be cured in either steam or hot air in the wire manufacturing process. K-1357 is said to give excellent electrical and physical properties at moderate cost, in addition to affording savings in the fabrication process.

Both compounds are white in color, and can be easily colored to desired shades.

Some typical physical properties of K-1347 molded slabs (cured with 1.9 pph 2,4 dichlorobenzoyl peroxide paste—40.0%) are reported as follows.

Property	Mold Cured 15 Min. @ 250° F.	Postcured 24 hr. @ 480° F.	Postcured 15 Days @ 410° F.
Tensile, psi	1,400	1,200	1,000
Elongation, %	400	200	160
Hardness, Shore A	56	75	80
Die B, tear, lb./in.	200	100	—
Brittle point, °F.	−100	−100	−100
Specific gravity	1.20	—	—

A technical bulletin giving more detailed information on K-1347 is available from the company.

Motorized Micrometer

(*Continued from page 478*)

Measuring anvils are lapped flat stainless steel, with the lower anvil adjustable with three lock screws to obtain exact parallelism of the measuring surfaces. The cam which lowers the dead-weight measuring load loses contact with the load during the dwell period when the measurement is being noted. Thus only the dead weight exerts pressure on the sheet. The operator has two hands free to handle the sheet and write down the readings. Cycling time for each measurement is five seconds, but other speeds can be furnished.

When many measurements are to be made, a considerable saving in time is possible with less operator fatigue and less chance for error. Measurement of compressible sheet materials such as plastics, paper, and paperboard can now be made with confidence that the results are accurate and that the data compiled will be of value in the future.

A complete brochure covering screw type, spring type, and dead-weight micrometers in both manual and motorized models may be had from Testing Machines, Inc.

Strong Restraining Influences...

Roebling Hose Reinforcing Wire

Roebling Hose Wire, Hose Reinforcing Wire and Hose Wrapping Wire bear the stamp of Roebling's strict attention to constant uniformity. As with all Roebling wire products, each is wholly Roebling-made and Roebling-controlled, from open hearth to packaging. Tensile strength and forming qualities, finish and gage are of an excellence that proves itself in use.

Resistance to internal and external pressures and wear are what you look for in hose wires and what you pay for. With Roebling, you *get* them.

For further information on these and other Roebling quality products, write or call Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

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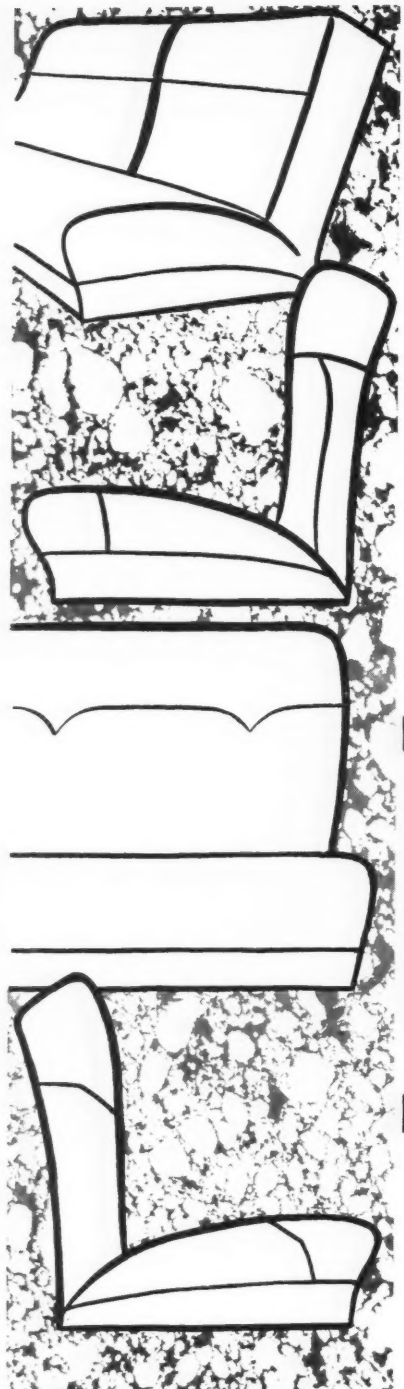

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With a ROYLE "Constant Pressure" Roller Feed Hopper, mechanical rubber goods and insulated wire can be produced to extremely close tolerances.

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Royle "Constant Pressure" Roller Feed Hoppers are suitable for all sizes of extruders.

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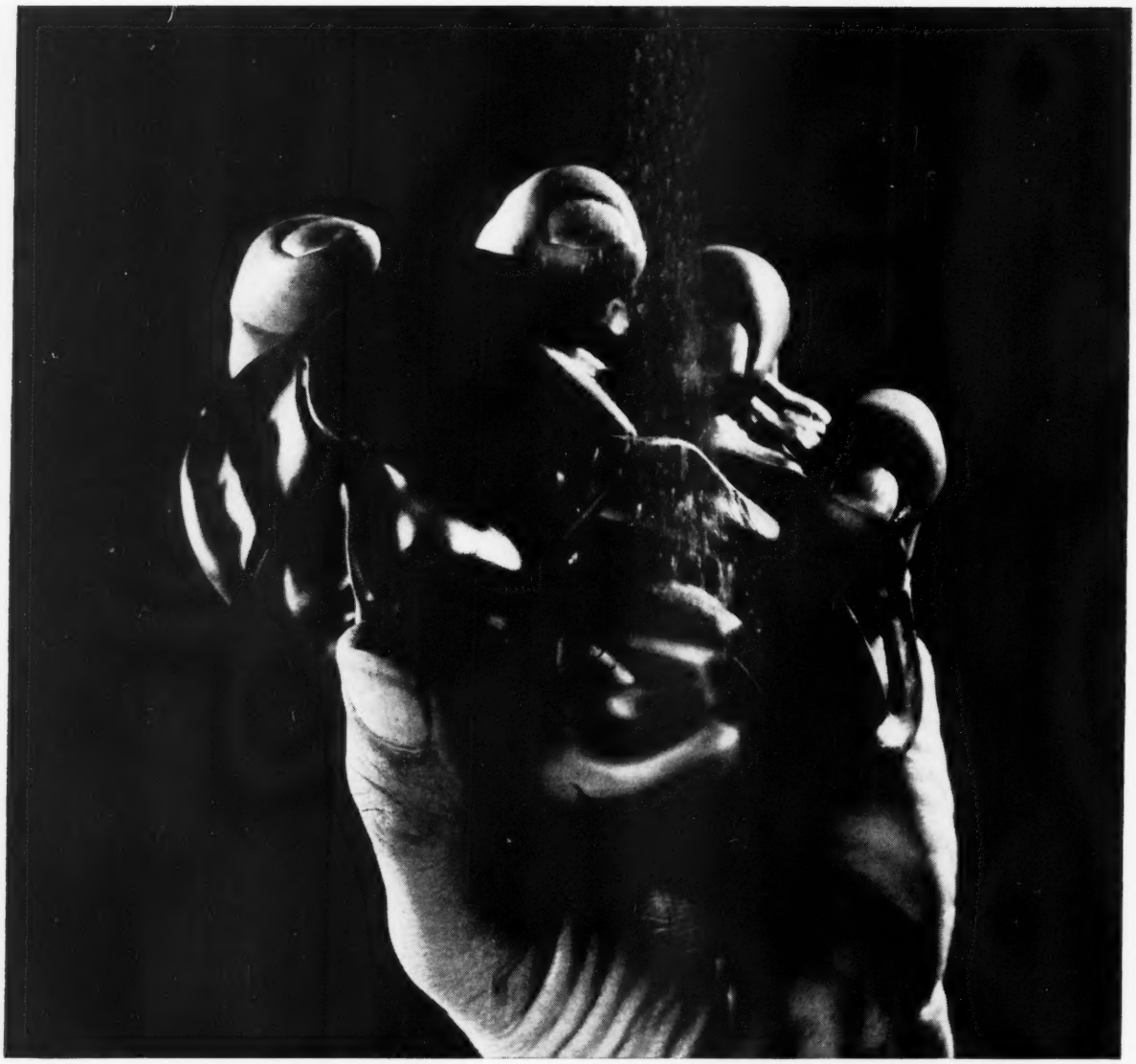
Chemicals for the rubber, paint, paper, textile, plastics and other industries: **GENTRO SBR** *rubber* **GENTRO-JET** *black masterbatch* • **GEN-FLO** *styrene-butadiene latices* • **GEN-TAC** *vinyl pyridine latex* • **GENTHANE** *polyurethane elastomer* • **ACRI-FLO** *styrene-acrylic latices* • **VYGEN PVC** *resins and compounds* • **KURE-BLEND** TMTD *masterbatch* • **KO-BLEND** *insoluble sulfur masterbatch*



Add the pinch of permanence

that softens . . . then hardens for keeps

For rubber products that stay soft while you're mixing, and harden permanently when you mold them, use Durez phenolic resins.

Under the heat of mixing, the resin melts to give you an easy-working stock in which fillers disperse rapidly and evenly.

In the mold, the resin builds hardness and stiffness into the material—to stay.

Only 5 to 10 parts of resin per 100 of rubber will develop a Shore A hardness of 90-100 in an SBR shoe-sole compound with normal loading. Increase the resin to 20 parts, with some nitrile as a common flux—and you get still greater hardness and boardiness, a rise in abrasion resistance, a drop in distortion under heat. Tensile strength stays up where you like to see it.

Temperatures as high as 250°F cannot take these properties away. You get more durability with Durez resins than with other types of resins.

See for yourself what a pinch of permanence can do for your hard-rubber products—SBR or nitrile, natural or neoprene—and for solvent-type adhesives, too. To get more information, write today for the illustrated bulletin "Durez Resins in the Rubber Industry." It's free.

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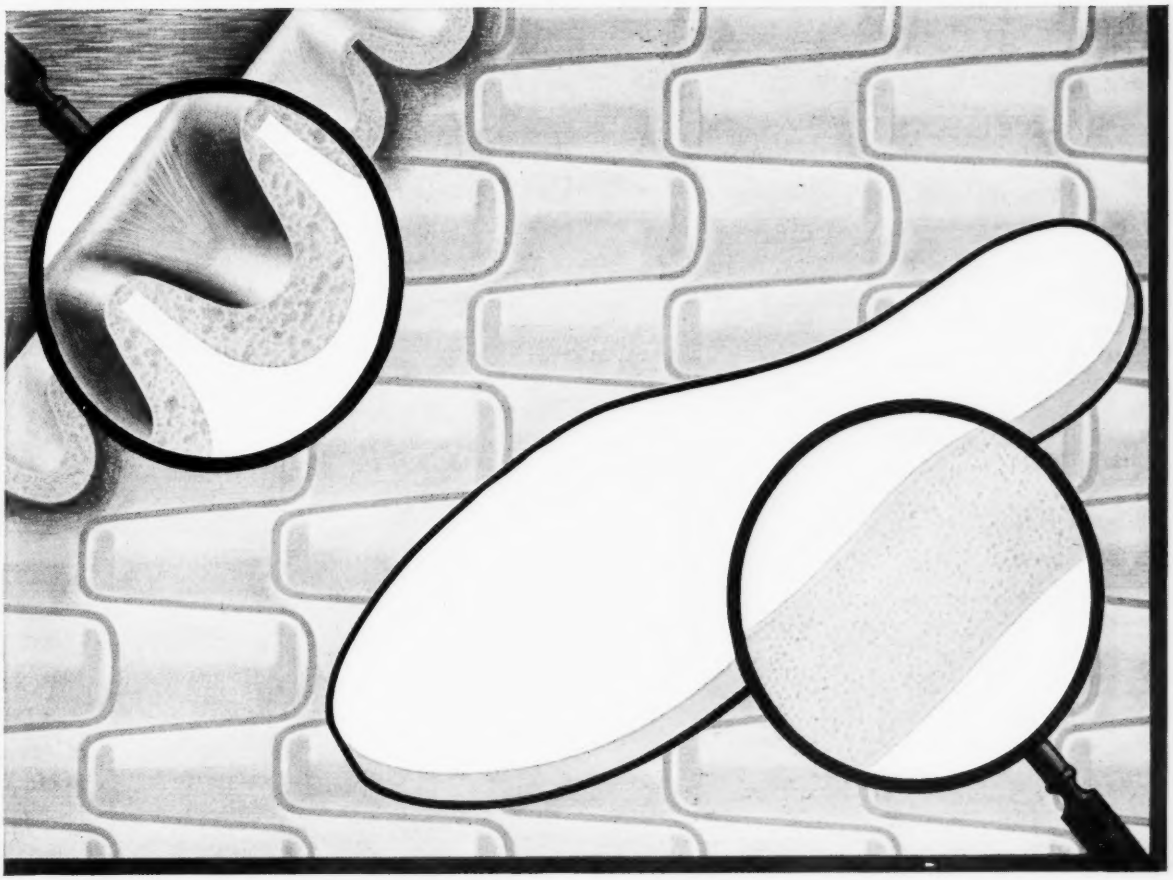

NEW! S-1509 rubber for sponge

...light color, low viscosity

Here is still another important new product of Shell synthetic rubber research—time-and-cost saving S-1509 for closed or open cell sponge. Suggested applications: closed cell shoe soles; open cell rug underlay and automotive sponge.

Read the following list of advantages—and you will understand how new S-1509 can save you both time and money—

Light Color—Non-staining and non-discoloring S-1509 is excellent for white stocks not only because of its own inherent light color but also because it eliminates discoloring peptizing agents.

Low Viscosity—S-1509 has a viscosity range of 30-38; it needs no breakdown and comes to you ready for immediate processing in sponge applications.

No Excessive Tack—S-1509 reduces the tendency of compounds to stick on the mill roll or mold surface.

Outstanding Physical Properties—Properties of S-1509 stocks closely compare with those of plasticized high Mooney counterparts such as S-1502 compounds.

Superior Mold Flow—Stocks made with S-1509 provide sharp design transfer from the most intricate mold to the finished product.

Low Water Absorption—Because S-1509 is coagulated with alum, it is recommended for applications which require low water absorption.

S-1509 may be used to advantage in other products than sponge: wherever a combination of the above features is desired.

Write or phone today for more detailed information on S-1509 or Shell's complete line of general purpose rubber polymers.

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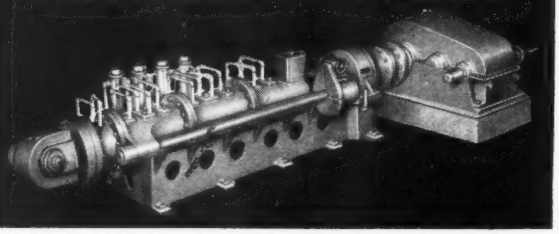

● Now, *you* can use this new process to produce BETTER Reclaimed Rubber FASTER and at LOWER COST!

RECLAIMATOR reclaims have more usable rubber hydrocarbon and are more completely devulcanized than conventional reclaims. They are softer, break down faster and disperse more quickly into the rubber base of a compound. Rubber reclaimed by this method remains plastic and does not age as much, or as rapidly, as old fashioned reclaims. These and many more advantages add up to a higher quality, lower cost rubber for both producer and user.

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Send for Reclaimator Book 21. Explains in great detail how RECLAIMATOR reclaims can benefit you in your industrial needs.

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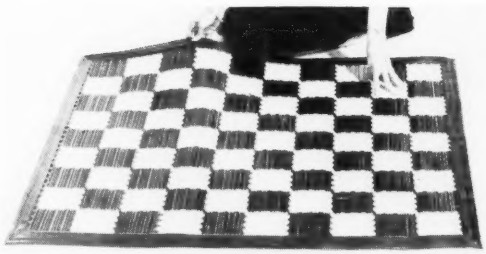
NEW PRODUCTS



Parco Paragon Mat

New Pawling Paragon Mat

A new mat designed for maximum safety and easy maintenance has been introduced by Pawling Rubber Corp., Pawling, N. Y. Since the new mat is constructed without holes, spiked heels are safe on its surface. The Paragon mat, which can be reversed, contains flexible wiping blades that trap dirt efficiently, it is reported.

Made of poly(vinyl chloride) compounds, the mat is said to have long life and color stability. The entrance mat features four-by-four-inch link sections which permit unusual checkerboard or solid color designs. It may also be rolled easily. Steel for reinforced nosings eliminates corner curling and protects the mat when it is being handled. Brass or stainless-steel wires are available on order.

The Paragon Mat is available in the following colors—black, white, terra cotta, blue, dark green, light green, red, grey, yellow, and orange. The new mat is designed for use in homes, motels, hotels, restaurants, office buildings, schools, department stores, and other areas.

New Redesigned Seiberling Tires

Seiberling Rubber Co., Akron, O., preparing for the increased demands on tires created by high speeds and more inter-city driving, has introduced new models of its premium and first-line passenger tires.

In a new program to bring out redesigned tires in all lines, the company has a new premium-level Safety tire, a restyled Super Service tire, and new sizes in both models. Both tires are available either in nylon or Tyrex and both feature a tread compounded of "Carbojet" high-dispersion black rubber.

The premium-level Safety tire has a wider and deeper tread in comparable sizes than any previous Seiberling model which should result in substantial improvements in tread wear. All models of the Safety tire feature a new six-rib tread design providing better non-skid qualities and quieter running than previous designs, reports the company. The tire has been restyled, but it still features the Seiberling company's exclusive heat vents, which are small holes in the shoulder area that disperse flexing heat.

The Super Service tire, at the original-equipment price level, also has new tread and shoulder designs, and an expanded size range. It features a deep seven-rib tread and plain sidewall design. This tire is available for the first time in almost all variations: nylon and rayon, tubeless and tube-type, and black-and-white sidewalls. It also is now being produced in small-tire sizes for the new American compact cars.

need better protection for rubber goods?

use **OZONO**

(anti-ozonant) (anti-oxidant) (anti-suncheck agent) (costs less)

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To protect rubber goods against weather and flex cracking, a unique anti-ozonant, anti-oxidant and anti-suncheck agent, **OZONO** is now being offered to the rubber industry.

Manufactured by a new special process, **OZONO** affords better ozone, oxygen and sun cracking protection than mixtures of commercial anti-ozonants and waxes used separately. Tests show that an equal degree of protection is obtained at **OZONO** concentrations at appreciably smaller costs than with the amounts of commercial agents normally used.

Showing excellent protective value against heat, oxygen, fatigue flexing, copper deterioration and ozone cracking, **OZONO** is made in a form which simplifies its incorporation into rubber stock in an internal mixer or on a mill.

Recommended for use on such stock as tire carcass, inner tubes, footwear, molded heels or soles, sundries, sponge, automotive rubber, wire insulation, tubing, and all rubber goods exposed to the elements.

OZONO - - - *another triumph from Beacon Research*

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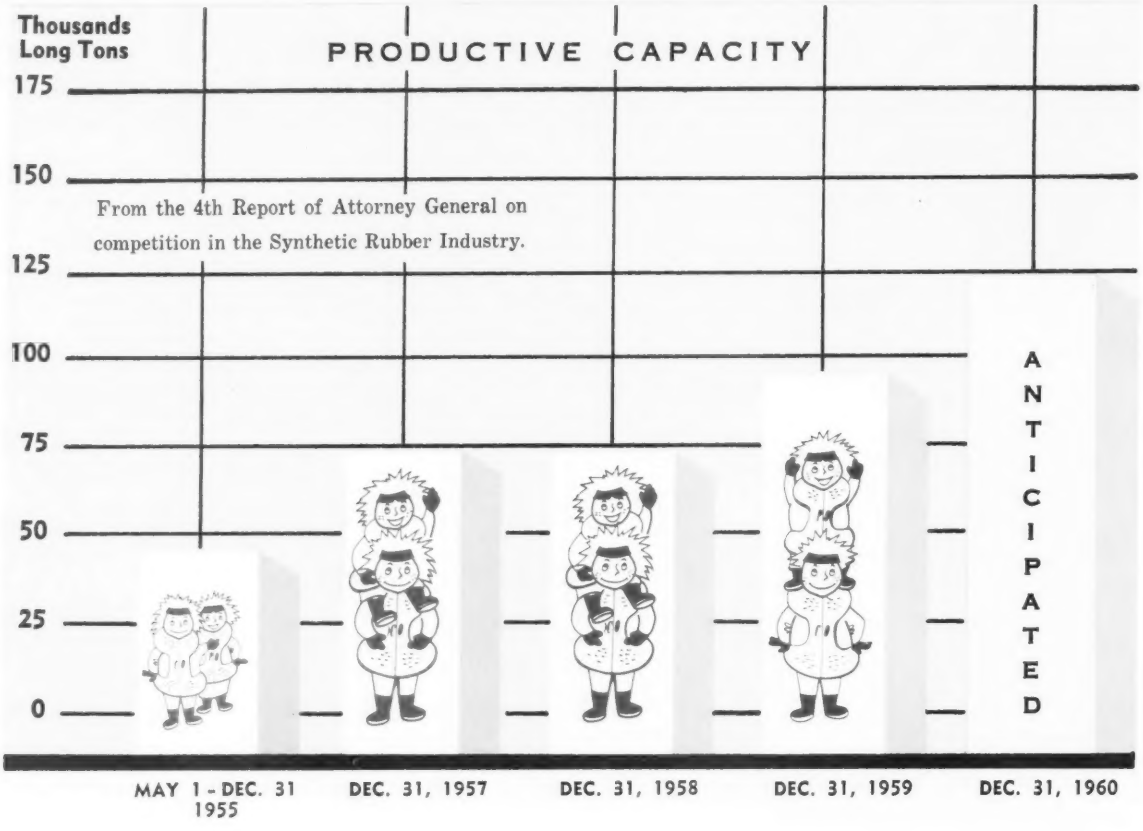

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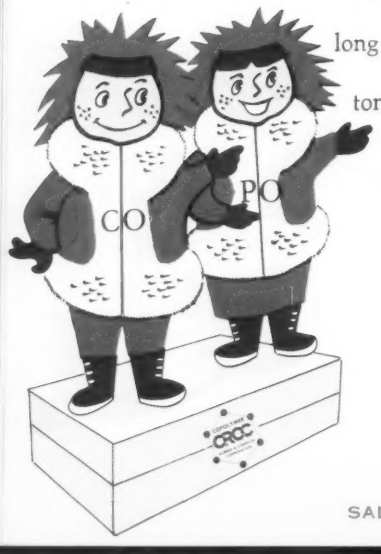

1. Our capacity has increased from 49,000 long tons to 95,000 long tons per year. In 1960 our capacity will be 125,000 long tons per year — *an increase of 155%.*

2. Our share of the domestic S.B.R. market has increased from 5.6% to 7.9% of the total — *an increase of 41%.*

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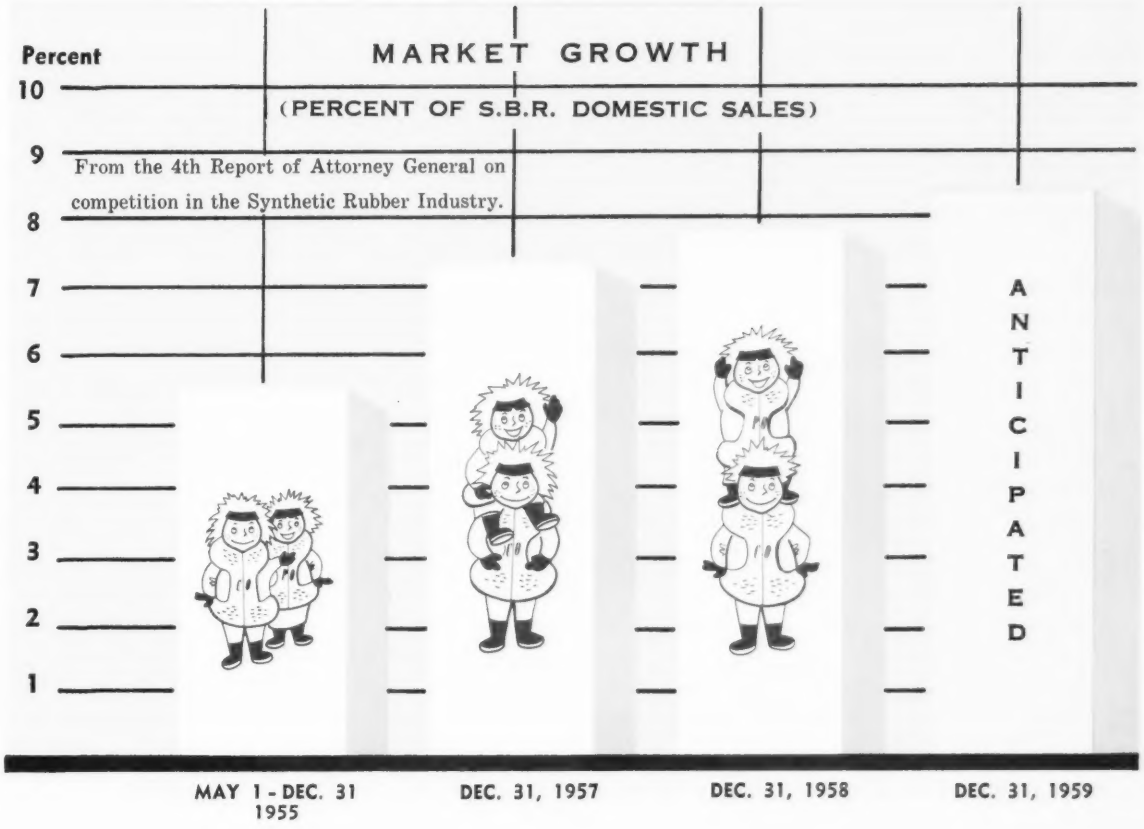

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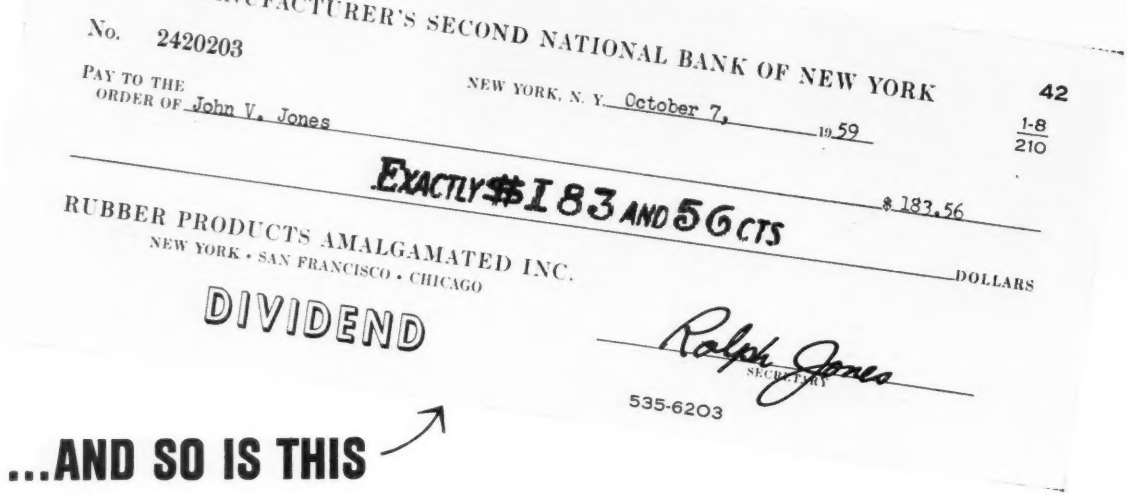

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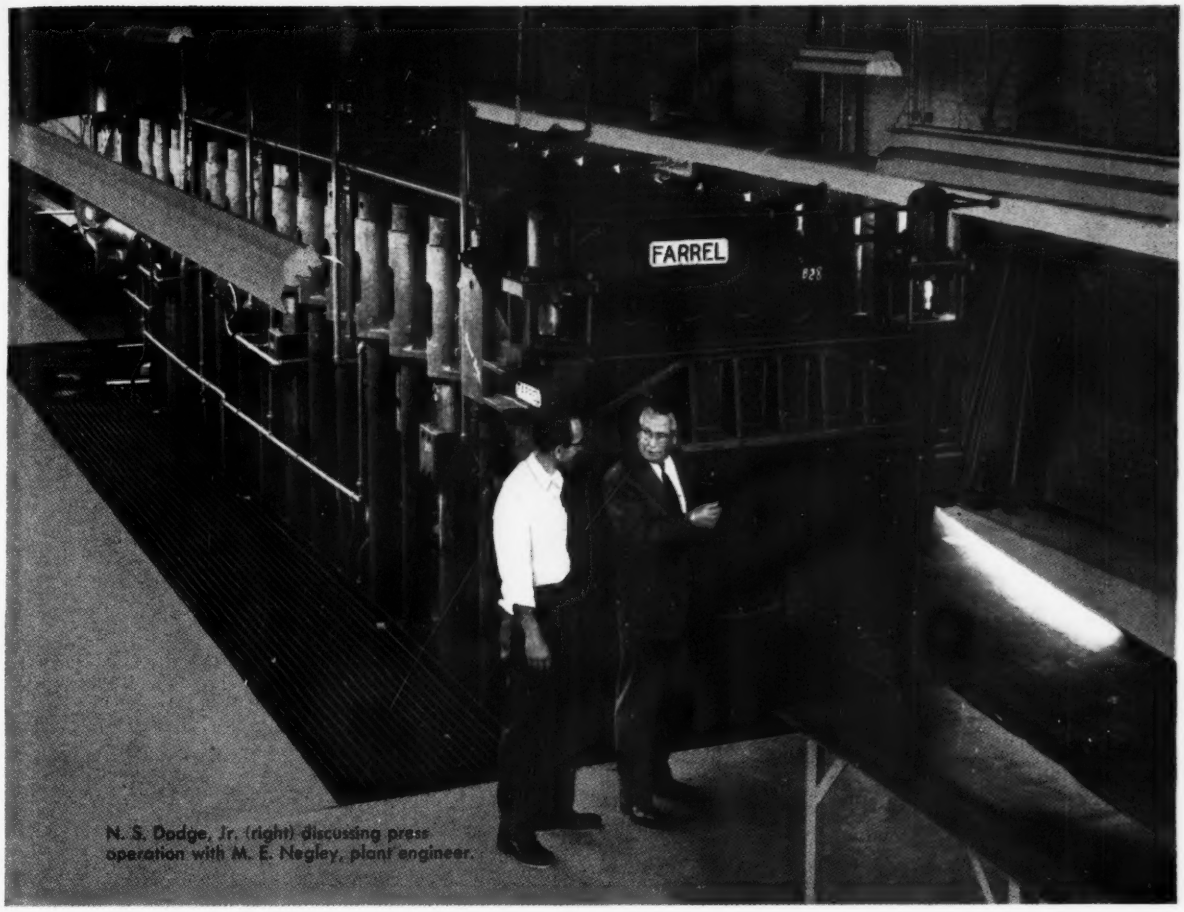

N. S. Dodge, Jr. (right) discussing press operation with M. E. Negley, plant engineer.

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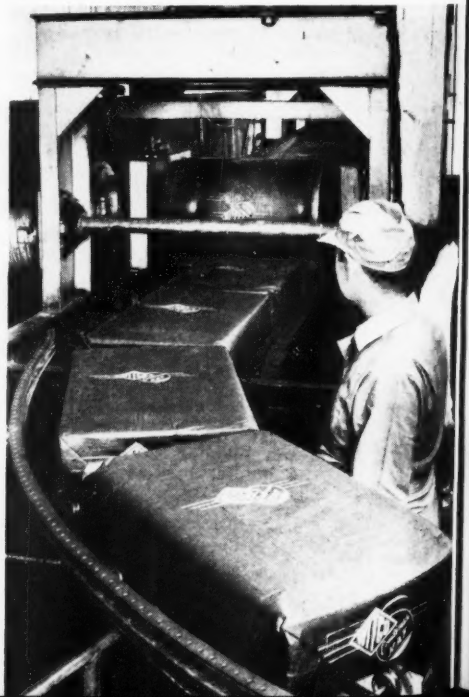

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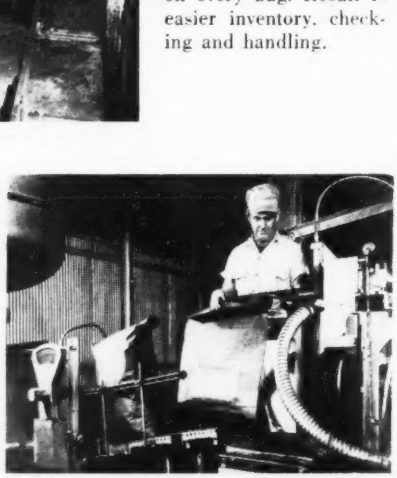

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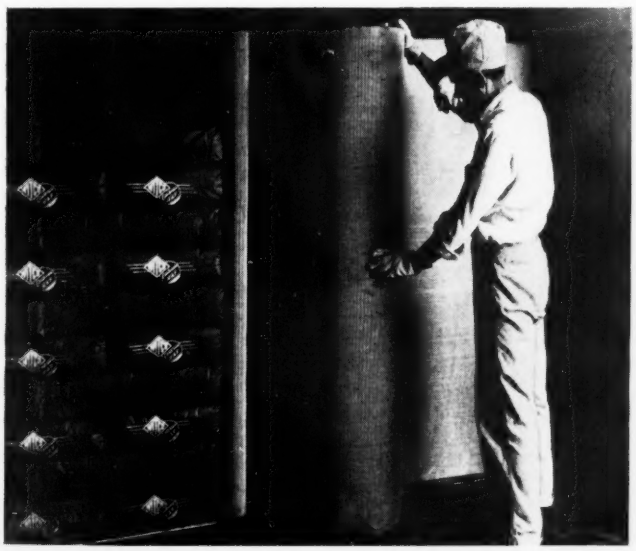

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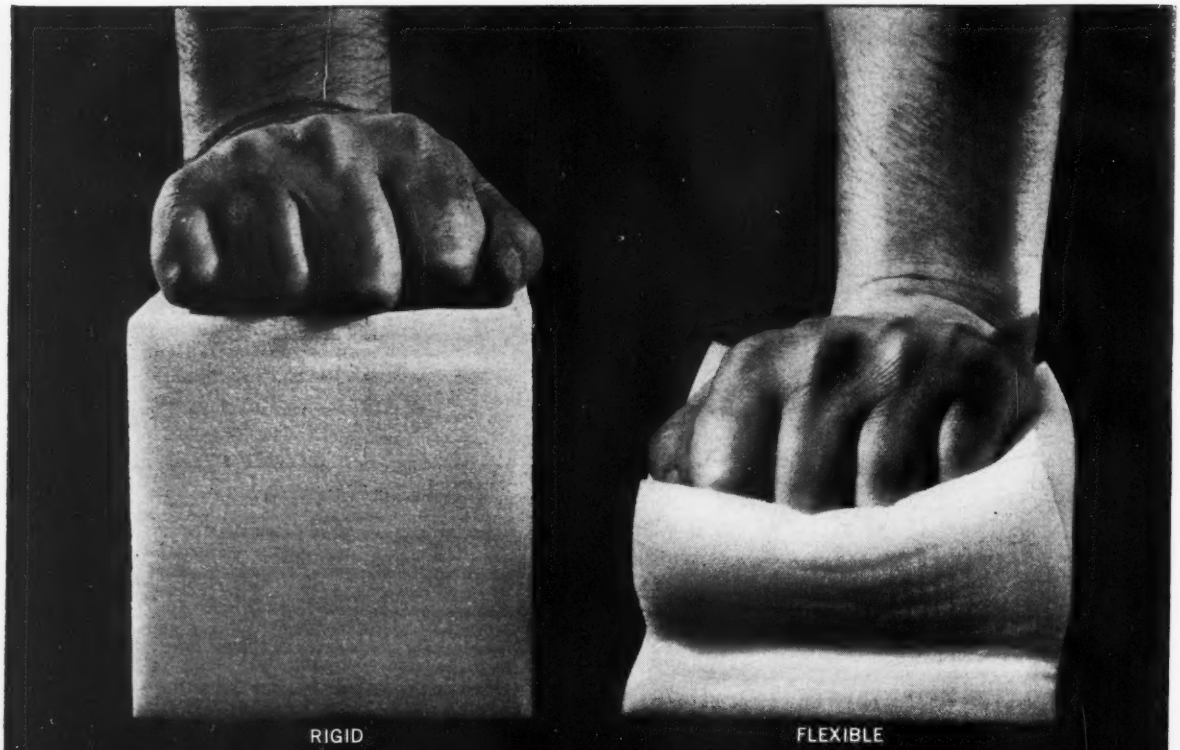

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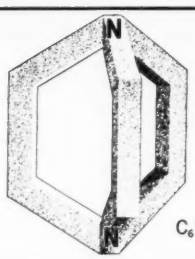

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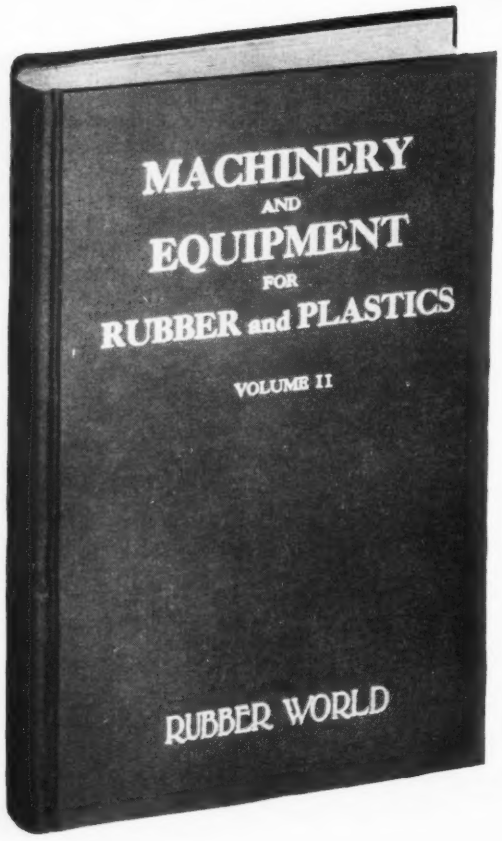

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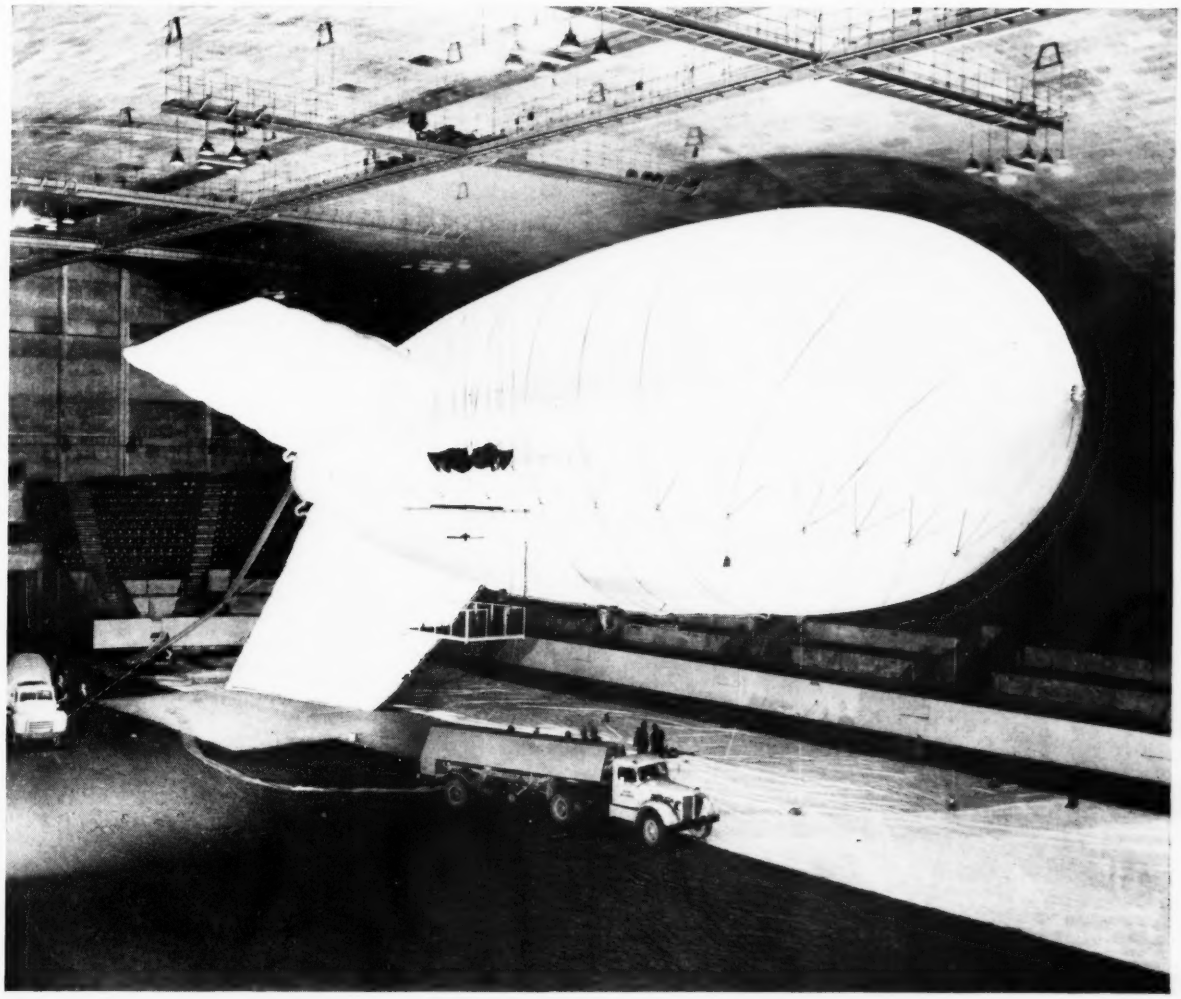

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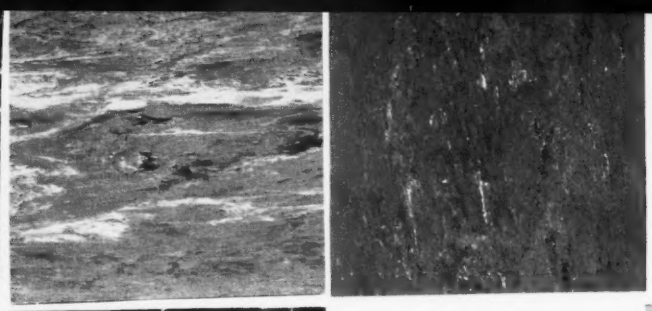

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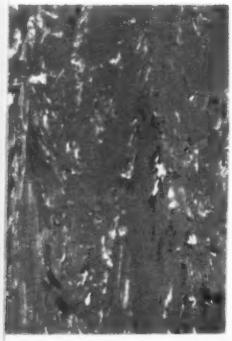

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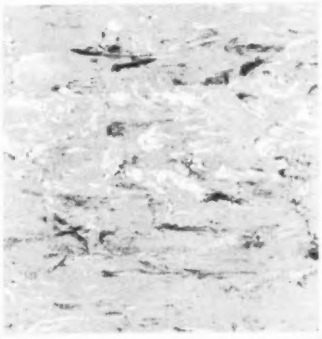

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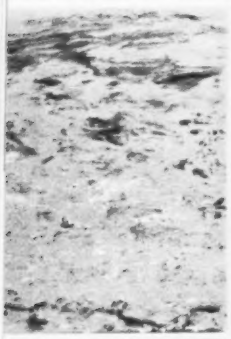

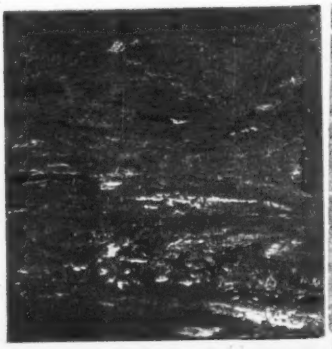

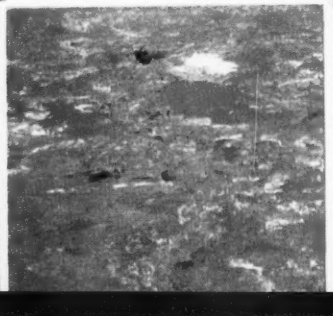

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Polymer			Polymer—100 pts.
Oil			NAPH—37.5 pts.
PROPERTIES			
CHEMICAL	**Specifications**	**Specifications**	**Tentative Specifications**
Volatile Matter % wt.	0.50 (Max.)	0.75 (Max.)	0.75 (Max.)
Ash % wt.	1.50 (Max.)	1.50 (Max.)	0.50 (Max.)
Organic Acid % wt.	4.00–6.25	4.75–7.00	3.90–5.70
Soap % wt.	0.75 (Max.)	0.50 (Max.)	0.50 (Max.)
Bound Styrene % wt.	22.5–24.5	22.5–24.5	22.5–24.5
Stabilizer % wt.	1.25 added	1.25 added	1.25 added*
PHYSICAL	**Specifications**	**Specifications**	**Typical Properties**
Raw Viscosity, ML-4′–212° F.	44–52	46–58	56
Cpd. Viscosity, ML-4′–212° F.	73 (Max.)	73 (Max.)	52
Tensile psi 50′	2500 (Min.)	3100 (Min.)	2550
Elongation % 50′	500 (Min.)	575 (Min.)	520
=**Modulus** psi 25′	325–625	350–650	700
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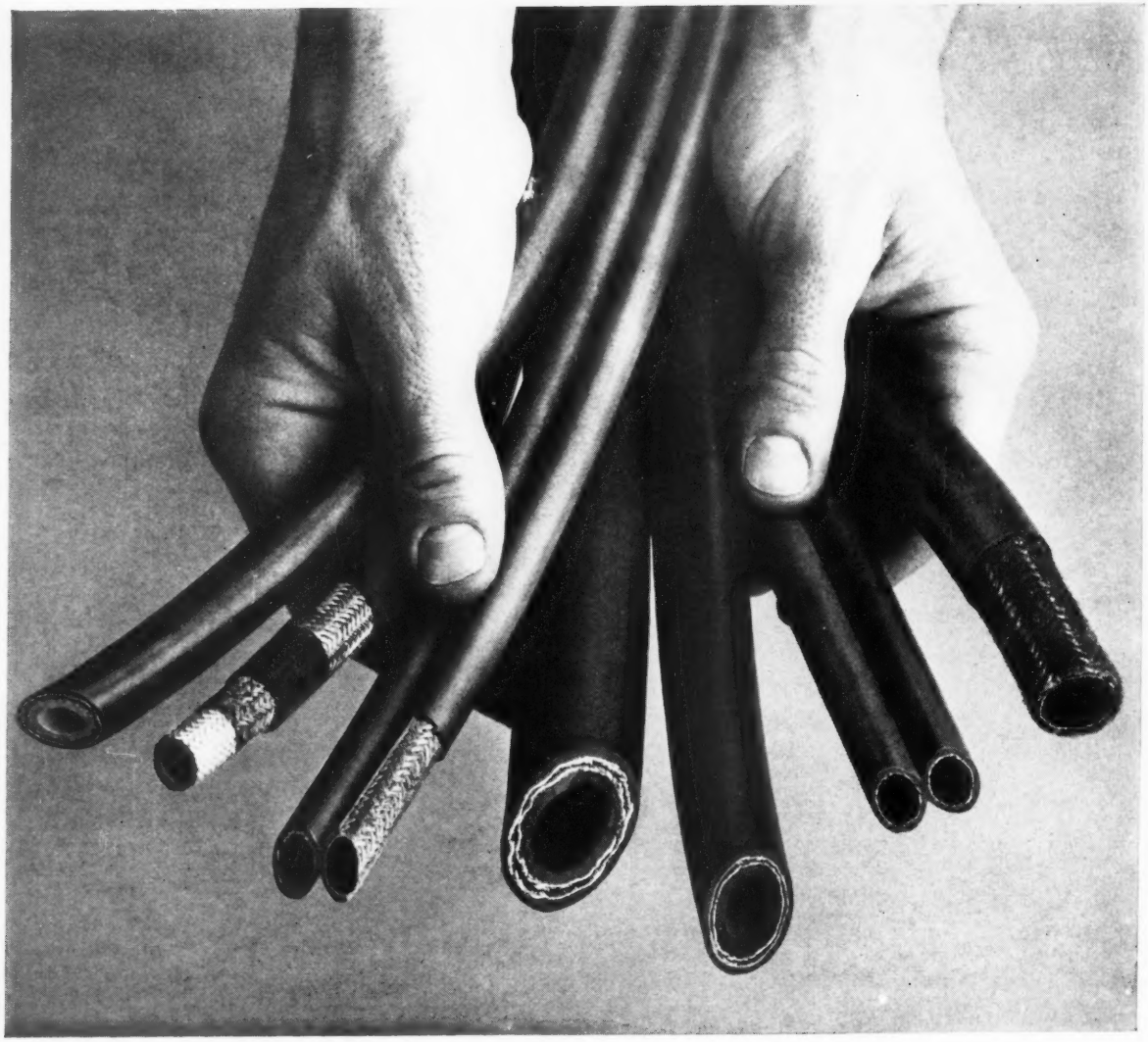

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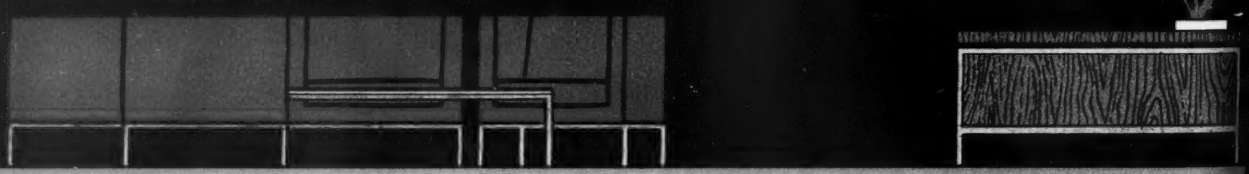

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RUBBER WORLD
EDITORIAL

Food Additives Law Compromise Necessary To Avoid Chaos

MANUFACTURERS of a large number of rubber products used in the food industry are caught on the horns of a dilemma with the rapidly approaching deadline of March 6, 1960, when all compounds from which these products are made must have been approved by the Food & Drug Administration. Although many companies have been working to obtain such approval for the past year, it is understood that they have not been able to provide tests and test programs acceptable to the FDA.

This new requirement for these products stems from Public Law 85-929 of September, 1958, the Food Additives Amendment to the Federal Food, Drug and Cosmetic Act, which prohibits the use in food of additives that "have not been adequately tested to establish their safety." A food additive defined in its broadest sense by the law includes "any substance intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting or holding food," thus including rubber belting, hose, and many other products employed in the food industry.

The burden of proof is really on the rubber product manufacturer since he must submit the formulation of each compound used to the federal agency together with the results of a laboratory investigation conducted by a qualified independent testing organization. These tests must show to the satisfaction of the FDA that either (a) no substance can be extracted from the rubber compound under test conditions simulating food service, or (b) the substance or substances extracted from the compound under test conditions can be identified and determined to be harmless to the health of man or beast.

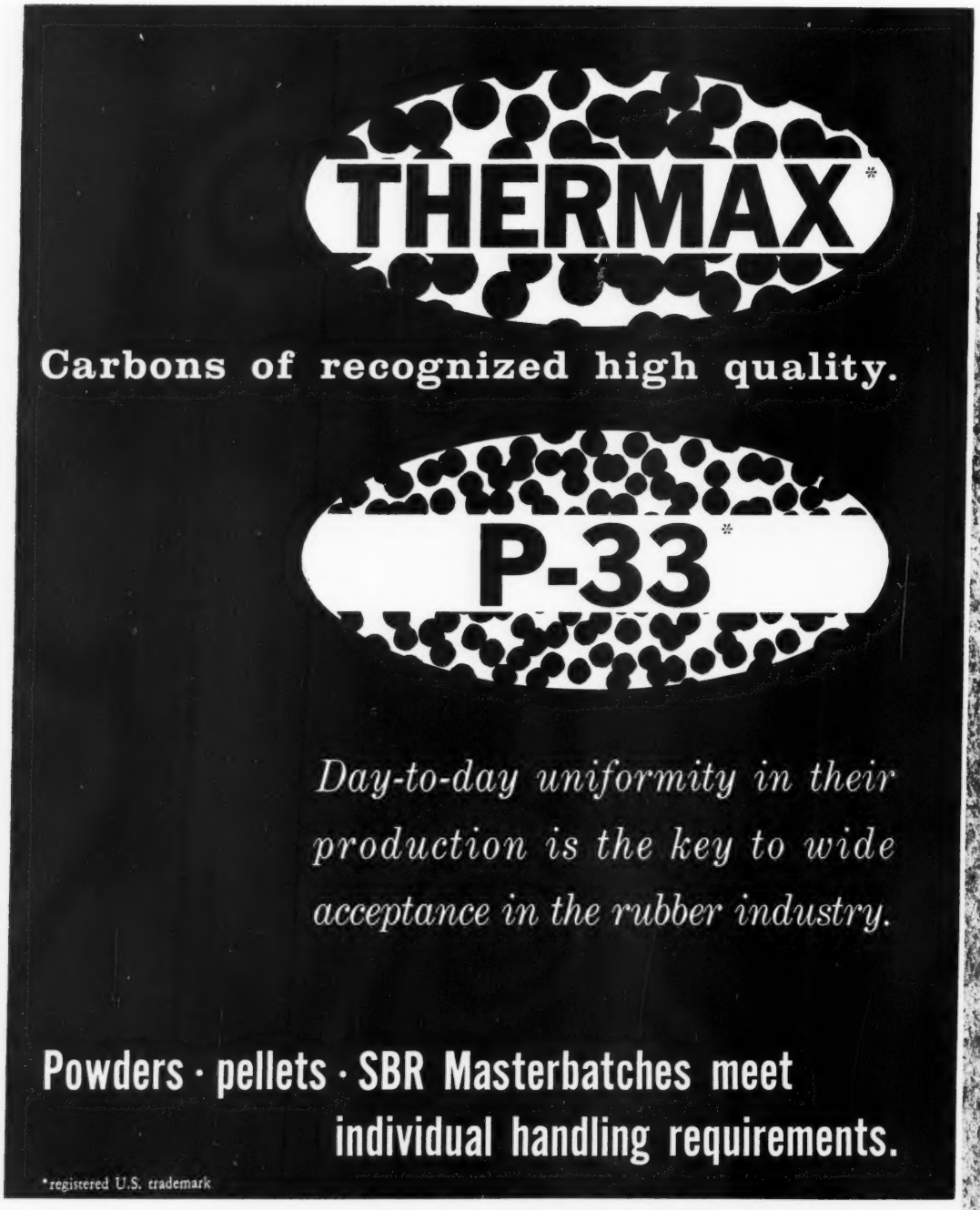
One cannot quarrel with the principle of the Food Additives Law, but it would appear to have been demonstrated during the past year or more that the requirements and conditions of the law have resulted in an impractical and almost impossible situation for the rubber products manufacturer. There were hundreds and even thousands of compounds to be tested in many different ways, and there was not sufficient time for developing and conducting all of these tests.

A special committee of the Rubber Manufacturers Association has recently been assembling a list of all products made for the food industry and how long they have been in use. The RMA has been assembling another list of the raw materials used in the manufacture of these rubber products.

Although the Food Additives Law requires all rubber compounds in contact with food to be tested even though it could be shown that the compound had been used for 10 or 20 years without any harmful effect, it would seem that some compromise should be made in this connection.

No new products should be approved without complete tests, but products of proven performance should be granted tentative approval until a more practical test program can be devised.

R. G. Seaman
EDITOR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RUBBER WORLD

Planned Experiments In the Rubber Industry[1]

By J. A. SIGMANN
R. T. Vanderbilt Co., New York, N. Y.

THE use of mathematical statistics and the concepts of quality control have been accepted by industry, in general, as a valuable tool. Control charts and process capability studies have vastly improved many manufacturing situations.

Many rubber companies have well-established quality control programs designed primarily to assure or maintain some specific quality level for their production. Only a very few of these companies have investigated the benefits that can be derived from planned experiments conducted by their research and development departments.

Experimental Methods Compared

A planned or designed experiment is one in which statistical techniques allow for the investigation of two or more variables at one time; while the more familiar classical approach is to keep all factors constant except the one variable under immediate consideration.

The planned experiment is so designed that each level or variation of any one factor is tested in the presence of all combinations of levels of the other factors. Such design can be symbolized by squares or rectangles and is called factorial design because the number of experimental combinations required is the product of the number of variations of each of the factors.

Edisonian Experiment

The classical or Edisonian type of experimental method can be demonstrated by a simple example in which

[1]Based on a paper presented before the Philadelphia Rubber Group, Philadelphia, Pa., Apr. 25, 1958.

The Author

John A. Sigmann, statistician, R. T. Vanderbilt Co., received his B.S. from Ohio University in 1947 and his M.S. from the same university in 1950.

He joined the R. T. Vanderbilt Co. as a chemist in 1950, worked as a production chemist from 1953 until 1957, at which time he became a statistician, his present position.

Mr. Sigmann is a member of the American Chemical Society and its Division of Rubber Chemistry and a senior member of the American Society for Quality Control.

	X_0		X_1	
	T_0	T_1	T_0	T_1
A_0	1	2	3	4
A_1	5	6	7	8

Fig. 1. An example of factorial design for investigating three factors at two levels. Items within solid lines apply to Edisonian-type experiment; items within both solid and dotted lines, to planned experiment

	X_0		X_1	
	T_0	T_1	T_0	T_1
A_0	1 51	2 55	3 46	4 48
A_1	5 52	6 54	7 45	8 49

Fig. 2. Shore hardness results obtained with factorial design outlined in Figure 1. Small numbers in lower left of blocks are experiment numbers as shown in the planned design of Figure 1

Fig. 3. Fractional factorial design (1/4 replicate). Six factors at two levels investigated

			BANBURY				MILL			
			8-MINUTE		14-MINUTE		1/3 NORMAL		NORMAL	
			200°F.	250°F.	200°F.	250°F.	80°F	175°F.	80°F.	175°F.
OVERLOAD	4% P.A.	PREMAST.	A_8			A_2				
		UNBROKEN					B_8			B_7
	0% P.A.	PREMAST.		A_1	A_7					
		UNBROKEN						B_1	B_5	
UNDERLOAD	4% P.A.	PREMAST.					B_2			B_4
		UNBROKEN	A_4			A_6				
	0% P.A.	PREMAST.						B_3	B_6	
		UNBROKEN		A_5	A_3					

three variables are to be considered. The first of these is time, which is designated by T. T_0 is used to designate the lower level or standard length of time, and T_1 any other length of time considered feasible to the experimenter. The second variable would have two levels, A_0 and A_1, which would correspond to a standard amount of accelerator and some different amount of the same accelerator. It should be noted that rather than consider two different amounts of the same accelerator, the experimenter may choose two different types of accelerator as his two levels. The two levels of the third variable, filler for example, would similarly be designated X_0 and X_1 to indicate the lower and the higher level of this material.

The base or control compound in the Edisonian approach to the problem would be designated as $T_0A_0X_0$ (see Compound No. 1, Figure 1), which means that it contains the lowest level of time, acceleration, and filler. The first step in the problem would be to prepare a second compound, $T_1A_0X_0$, (Compound No. 2, Figure 1) which would be used to give a comparison between the two levels of time under consideration. The next step would be to prepare another compound, $T_0A_1X_0$ (Compound No. 5, Figure 1), to estimate the effect of difference in acceleration. The last variable would be handled by the preparation of $T_0A_0X_1$ (Compound No. 3, Figure 1), which would be compared with the control compound $T_0A_0X_0$ to obtain an estimate of the effect of changing from one level of filler to another.

To make any of the three comparisons, therefore, each of the three additional compounds would be paired individually with the same control sample. If, by chance, the control were in error, each of the conclusions for each of the variables would likewise be correspondingly in error, and this is a fairly large gamble for an experimenter to take.

Planned Experiment

In a factorial designed experiment, as shown by the blocks enclosed by both the solid and dotted lines of Figure 1, each level of one variable is investigated with both levels of the other variables. Compound Nos. 1, 2, 3, and 5 enclosed within the solid lines of Figure 1 correspond to those suggested in the Edisonian-type experiment. Instead of repeating these as in the classical approach, with the planned experiment, Compound Nos. 4, 6, 7, and 8 have been added to make a different total of eight. All eight of the compounds are used to

Planned Experiments in the Rubber Industry

A comparison is made of the concept of planned experiments and the more familiar classical or Edisonian approach commonly employed to solve research and development problems in the rubber and associated industries.

The planned experiment is so designed that generally each level or variation of any one factor is tested in the presence of all combinations of levels of the other factors. The Edisonian approach to experimentation keeps all factors constant except the one variable under immediate consideration and may be wasteful of time and effort.

In an actual case history it is shown how the basic procedures are applied to construct a planned experiment in which the principle of factorial design is used, and 1/4 and 1/2 replication of the factorial design is employed to arrive at the solution of a problem of rating the dispersibility of samples of a given powder in rubber.

It is emphasized that round-table discussions attended by all interested parties are a prerequisite for any well-planned experiment, and that although there are no universal plans in connection with the development of planned experiments, there are several universal principles, the most important of which is a clear statement of the problem.

estimate the effect of each variable. Some typical hardness data obtained from this experiment are shown in Figure 2.

In order to calculate an average effect due to changing T (time), Compound Nos. 1, 3, 5, and 7 are summed and averaged to establish an average T_0 value of 48.5, which is compared with the average T_1 value of 51.5 obtained from Compound Nos. 2, 4, 6, and 8. The A (accelerator) effect results from a comparison of the average of the hardness values of Compound Nos. 1, 2, 3, and 4, which is 50, with the average of Compound Nos. 5, 6, 7, and 8, which is also 50. The average effect due to changing fillers or filler levels, in this instance X_0 and X_1, is calculated in a like manner; Compound Nos. 1, 2, 5, and 6, averaging 53, are compared with Compound Nos. 3, 4, 7, and 8, which average 47.

Inspection of the averages is often all that the compounder needs to do in the way of formal analysis. If there is a large difference noted between the two levels of variable in question, such as is the case with X_0 and X_1, there can be little doubt that variability exists between these levels of filler. If, on the other hand, no differences are apparent, as shown by A_0 and A_1, it can be assumed that the variable in question, in this case accelerators or accelerator levels, is, in fact, a constant and can be treated as such in subsequent work with this particular set of conditions.

It should be noted that an error of 2 to 3 points in the hardness determination for any one compound results in less than one point change in any average effect, which is not the case when the classical experimental method is employed.

Planning of Experiments

In the planning of any experiment several basic rules should be followed. The most important is a clear statement of the problem, which sounds fairly simple, but is really the most critical phase of the operation and is often the most difficult. In general, a statement of the problem can be best accomplished by means of round-table discussions attended by all of those directly concerned with it.

The first step in defining or stating the problem is listing all of the known facts concerning it. The second step is listing the unknown factors; while the third and final step is stating the questions that need to be answered by the experiment. Once the problem has been clearly stated by these three lists, a likely model for the experiment becomes apparent.

Procedure for Planned Experiment

A typical plan of attack in designing an experiment to solve an actual problem is illustrated by the following example. It was required that a laboratory control test be developed to determine in advance the dispersibility of a particular powder in rubber when used in the factory under production conditions. Previous test procedures were of little value since nearly every batch tested on an open mill in the laboratory indicated good dispersion characteristics; while the same samples mixed in a Banbury indicated poor dispersion. No procedure was available, therefore, for providing a clear-cut answer to the dispersibility of the powder.

All the known and unknown factors in connection with the problem were listed and discussed; then the following six were chosen as the most likely contributors to possible variation in results: (1) Banbury *vs.* open mill mixing; (2) temperature of mixing; (3) time of mixing; (4) batch size; (5) processing aid used; (6) rubber (premasticated *vs.* unbroken).

After further discussion it was decided that two levels of each of the above six factors would be considered. The next immediate problem was to establish practical limits or levels of operation for each variable. These levels were set as wide as possible in order to be certain that they were significantly different.[2, 3]

[2]W. G. Cochran and G. M. Cox, "Experimental Designs." John Wiley & Sons, Inc., New York (1957).
[3]D. R. Cox, "Planning of Experiments." John S. Wiley & Sons, Inc. (1958).

Although the two temperatures selected for the open mill mixing were different from those selected for the Banbury, they were essentially high and low in each case. (See Figure 3.)

Similarly, two levels of time, long and short, were selected for each type of mixing. "Normal" and "1/3 normal" conditions with the open mill were selected for comparison with 8- and 14-minute Banbury mixing cycles. Six cuts and six passes were considered "normal" blending for the open mill.

A standard-batch size in the laboratory Banbury was taken as 1,050 cc. By increasing and decreasing the batch size by 15%, "overload" and "underload" conditions were established with respect to pressure on the batch. When the comparison between Banbury and open mill mixing on the basis of "underload" conditions was made, it was the smaller-size batch in the Banbury that was compared with the larger-size batch on the mill since the rolls were set further apart, and less pressure was exerted on the batch in the latter case. Conversely, "overload" conditions on the mill meant use of the smaller-size batch with mill rolls set closer together; while the use of the larger-size batch in the Banbury provided for "overload" conditions. The "overload" and "underload" conditions indicated in Figure 3 are therefore based on the pressure exerted on the batch in the Banbury or on the mill rather than the physical size of the batches.

The processing aid levels were set at 0% and 4% based on the rubber hydrocarbon. The two levels of RHC consisted of premasticated and unbroken rubber.

A ¼ replicate containing the 16 experiments illustrated in Figure 3 was selected as the first approach to the solution of this problem. A replicate may be defined as an aliquot portion of the entire experiment. Further explanation of replicates and replication may be found in any one of the several texts concerned with the design of experiments.[2, 3]

It should be noted that in each series, Banbury and open mill mixing, both levels of temperature, time, batch size, processing aid, and rubber are distributed equally throughout the plan.

A somewhat arbitrary decision had to be made to obtain the necessary data from the experiment. It was assumed that relatively "good" and "bad" samples of the powder with respect to dispersion characteristics could be selected from the results of previous work on the problem. Both types of samples of the powder were then mixed under the several conditions outlined in Figure 3 and, after being paired and coded, received one of three visual ratings. These ratings were as follows: a success (S) if the "good"-type sample dispersed better than the "bad"; a failure (F) if the "bad" type dispersed better than the "good"; and no decision (N) if both types dispersed equally well. Of the six people chosen to assign the ratings, two were completely unfamiliar with rubber and rubber technology, so that the team as such would represent a true cross-section with respect to knowledge of the subject, the dispersion of powder in rubber.

[4]C. A. Bennett and N. L. Franklin, "Statistical Analysis in Chemistry and the Chemical Industry." John S. Wiley & Sons, Inc. (1954).

Collection of Data

The next phase of the problem concerned the actual collection of the data which was done in a random manner,[4] that is, the order of mixing, and the evaluation of each sample was established by chance alone. A table of random numbers was used for this purpose. A deck of well-shuffled cards, slips of paper drawn from a hat, or any non-uniform method for the selection of numbers could also have been used equally well. This randomization gave each experiment an equal chance of being completed first, second, or last as the case may be, thus preventing bias from entering the experiment because the various steps were made in an orderly manner. The subscripts in Figure 3 indicate the order in which each set of conditions was used for testing both types of samples of the powder. Randomization is a simple, but effective way of minimizing the effects of chance variation that cannot be controlled and are ever present in any experiment.

After all the samples had been tested, the data were assembled into the form of the design. As mentioned before, quite often inspection alone is sufficient to give adequate answers to the points in question. In this case the results of seven out of eight of the experiments were successful in the "A" series (Banbury mix); while only two out of eight were successful in the "B" series (mill mix); therefore, it was decided to confine the balance of the work on the problem to Banbury mixes.

There were insufficient data for further decisions from the "A" series alone regarding the remaining five variables so that it was necessary to conduct a third or "C" series (further Banbury mixes), as shown in Figure 4 *(left)*. As before, each experiment of the "C" series was given one of three ratings; success (S), failure (F), or no decision (N). The combined results of both the "A" series (values underlined) and the "C" series shown in Figure 4 *(right)* constitute a ½ replicate, that is, one half of the possible combinations of Banbury mixes were completed.

Solution to Problem

A further round-table discussion of the results, as summarized in Figure 4 *(right)*, was held. It was decided that since the results of the experiments in the upper left-hand quadrant of Figure 4 *(right)* seemed to offer the most promise, the set of conditions included by the outlined block in Figure 4 (*right*) would be tried as the solution to the problem. These conditions were as follows: (1) Banbury mixing; (2) the lower mixing temperature; (3) the 8-minute cycle; (4) overload batch size; (5) 4% processing aid; (6) unbroken rubber.

This set of conditions did prove to be an adequate solution to the problem in that several additional operators were readily able to obtain reproducible results when other samples of "good" and "bad" types of the powder were tested according to these conditions.

Summary and Conclusions

A comparison of the concept of planned experiments with the more familiar classical or Edisonian approach commonly employed in attempts to solve research and

			BANBURY				BANBURY			
			8-MINUTE		14-MINUTE		8-MINUTE		14-MINUTE	
			200°F.	250°F.	200°F.	250°F.	200°F.	250°F.	200°F.	250°F.
OVERLOAD	4% P.A.	PREMAST					S			S
		UNBROKEN		C_1	C_5			S	N	
	0% P.A.	PREMAST						S	F	
		UNBROKEN	C_4			C_6	S			S
UNDERLOAD	4% P.A.	PREMAST		C_3	C_8			N	S	
		UNBROKEN					S			S
	0% P.A.	PREMAST	C_7			C_2	N			N
		UNBROKEN						S	S	

Fig. 4. Fractional factorial design for investigating five factors at two levels. On left, 1/4 replicate; on right, results "A" and "C" (underlined) series combined to constitute a 1/2 replicate

development problems indicates that much more information of greater value can be obtained from the same or a lesser number of experiments if statistical techniques are incorporated into experimental designs.

The Edisonian type of experiment may be wasteful of time and effort in that it is based on the investigation of only one variable at a time. In contrast, planned experiments can be made more economical by considering two or more variables at one time.

In an actual case history it is shown how the basic procedures are applied to construct a planned experiment in which the principle of factorial design is used, and ¼ and ½ replication of the factorial design employed to arrive at a suitable combination of the best levels of six variables involved in the determination of a laboratory control test for rating the dispersibility of samples of a given powder in rubber.

Round-table discussions attended by all interested parties are a prerequisite for any well-planned experiment. Once all of the important variables have been established, and practical limits have been set for each variable, a likely experimental model becomes self-evident. Although there are no universal plans in connection with the development of planned experiments, there are several universal principles, the most important of which is a clear statement of the problem. To be successful, even the best plans need the earnest cooperation of all concerned.

Warn Retreaders on "Quickie" Camelback Tests

The rapidly expanding retreading industry, in a search for consistant quality, is heading for trouble by using independent testing laboratories to grade the quality of camelback by tensile strength, specific gravity, modulus, hardness, and elongation, according to at least one of the major camelback suppliers. This type of product testing actually threatens to lower quality and create unnecessary confusion in the industry, according to J. W. Hodgson, The Firestone Tire & Rubber Co., Akron, O.

While these properties of rubber are very important in many cases and are widely used in the rubber industry, applying them to a special product such as camelback that is compounded to give mileage and performance will establish meaningless quality level specifications.

The only way to determine tread rubber quality from a mileage standpoint, Hodgson warns, is to put it out for comparison tests involving different types of tread rubber and actually run in road tests.

The conclusion reached by Firestone engineers after spending millions of dollars in research, development, and users' tests is that quick laboratory findings can never replace a comprehensive research program planned by men experienced in rubber chemistry.

The retreader can make tests to determine quality, but they must be of the road-test variety. Different types of tread rubber should be tried and road tested under all conditions. Making the mileage-performance test is the only practical test of the quality of tread rubber, according to experts who have long since given up trying to find a short cut to testing for tire mileage.

Direct Molded Footwear—II

Compounding and Processing

By W. E. KAVENAGH
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EFFICIENT economical operation of the expensive direct molded footwear demands much faster curing cycles than conventional sole and heel molding. To fulfill the necessary compound requirements, the compounder is faced with a new combination of problems.

The magnitude of these problems varies with the type of equipment involved, that is, whether internal- or external-pressure-type molding machine. In either case, any given compound must develop the lowest practical Mooney plasticity, the fastest, but safe curing cycle, and have sufficient built-in retardation which will not affect the curing cycle adversely, and, very important, the end-compound must have the longest possible shelf life.

Internal-pressure compounds are, of necessity, more heavily plasticized than those required for external-pressure equipment. The internal-pressure compound must be sufficiently plasticized to permit gas generated by the blowing agent to expand the compound before vulcanization really starts. (See Table 1.)

Blowing agents are divided into two groups: (1) sodium bicarbonate, ammonium bicarbonate, and ammonium carbonate which generate CO_2 gas, and (2) nitroso and hydrazine compounds which generate nitrogen gas during the vulcanizing period. Frequently, a combination of the two groups is used in the manufacture of direct molded footwear by the internal-pressure method.

Close plasticity control of the polymers used, of the milling, and each of the subsequent operations is of paramount importance. The relatively large quantities of oils and plasticizers required, together with adequate peptizing agents, make internal-pressure compounds difficult to process.

TABLE 1. COMPOUNDS REPRESENTATIVE OF THOSE USED IN INTERNAL-PRESSURE (BLOWN) DIRECT MOLDED SHOES

Compound A		Compound B	
Flat bark crepe	100.00	Masticated #3 SS	100.00
Sodium acetate	1.00	Peptizer	1.00
Peptizer	.50	Zinc oxide	4.00
Zinc oxide	3.00	Whiting	90.00
Titanium dioxide	20.00	Wood flour	50.00
Whiting	30.00	Ultramarine blue	20.00
Antioxidant	1.00	Stearic acid	4.00
Process oil	12.00	Rosin	8.00
Rosin	6.00	Antioxidant	1.00
Stearic acid	1.00	Process oil	20.00
Sulfur	2.50	Sulfur	3.00
Celogen AZ*	2.00	MBTS	1.50
MBTS	1.50	Ethasan†	.25
MBT	1.25	Porofor BSH‡	4.00
DOTG	.65		
Ultramarine blue	.30		

English Sponge Slipper

#3 Smoked sheet	100.00
High (85%) styrene resin	10.00
Peptizer	.25
Zinc oxide	5.00
Stearic atid	10.00
Antioxidant	1.00
Titanium dioxide	10.00
Whiting	30.00
Clay	30.00
Process oil	5.00
Petrolatum	5.00
Paraffin wax	1.25
Sodium bicarbonate	10.00
Porofor BSH paste‡	1.00
Sulfur	2.50

* Naugatuck Chemical, Naugatuck, Conn.
† Monsanto Chemical Co., Akron, O.
‡ Farbenfabriken Bayer A.G., Leverkusen, West Germany.

TABLE 2. TYPICAL GERMAN FORMULAS FOR TYPE OF SHOES SHOWN IN FIGURE 17

Sponge Formulas	A	B
Peptized smoked sheets	100.00	100.00
Duranit 10*	—	20.00
Zinc oxide (active)	5.00	5.00
Whiting	60.00	50.00
Calcium silicate	20.00	—
Stearic acid	1.00	1.00
Mineral oil	5.00	5.00
Rosin	1.00	1.00
Antioxidant	.80	.80
Red iron oxide	4.00	4.00
Ozokerite	.80	.80
Sulfur	2.50	2.50
MBT	1.60	1.60
Ethyl Zimate†	.40	.40
Porofor BSH paste	4.00	4.00

Tread Stock	
Brown crepe	100.00
Zinc oxide	5.00
Lithopone	5.00
Suprex Clay‡	150.00
Iron oxide	6.00
Stearic oxide	1.00
Benzoic acid	3.00
Vulkacit F§	1.60
Sulfur	2.50
Ground scrap	30.00 to 50.00

* 75% bound styrene, Huls A.G., Huls, Germany.
† R. T. Vanderbilt Co., Inc., New York, N. Y.
‡ J. M. Huber Corp., New York.
§ Farbenfabriken Bayer.

Fig. 16. A cutaway and complete picture of a house slipper with a completely blown sole made on an internal-pressure direct molded footwear machine

Because of the low plasticity, liberal use of dusting powders and heavily dusted liners is essential in stock preparation.

Whether mixed by open mill or Banbury, several breakdowns and remills are required to secure the proper plasticity.

For a completely blown shoe bottom, the thoroughly plasticized compound is calendered to a predetermined thickness on heavily dusted liners. (See Figure 16.) Where the "blown" bottom is reinforced with a longer wearing "tread" stock (unblown), the "sponge" or blowing compound is calendered on to the uncured, or semi-cured "tread" stock. (See Figure 17 and Table 2.)

The calendered stock for sponge alone or the sponge and tread combination is died-out to a closely controlled size and weight. Close control of both size and weight of the blank and stock placement in the mold is most essential to insure an acceptable end-product.

Compounds for external-pressure machines require an even more controlled balance of plasticity, curing cycles, and shelf-life. This point is particularly true of compounds for high-pressure machines. Since the metal last is not heated in high-pressure equipment, vulcanizing temperatures are transmitted from the mold base and side rings only; whereas heated lasts in low-pressure equipment transmit vulcanizing temperature from the last as well as from the mold base and side rings. Consequently, low-pressure compounds are not so "hot" or so difficult to process as high-pressure compounds.

In open-mill mixing it is a general practice to prepeptize the elastomers, followed by a rest period, and possibly by an extra remill. This same procedure is also followed to a certain extent in Banbury mixing. On the other hand, in some plants where scheduling or lack of storage space requires reasonably prompt use of mixed stock, more dependence is placed on post-peptizing, plus the use of adequate amounts of oils and plasticizers to secure the desired Mooney plasticity. Refining these mixes has been also helpful in attaining the required Mooney plasticity. This method of procedure provides lower milling costs, compared to use of masterbatching and non-productive mixes, with rest and remill periods.

In the last analysis, plasticity and accelerator balance must be such as to permit the compound to flow readily, when molding pressure is applied, with an accelerator ratio which insures a rapid, flat cure. Equally, or more important, the compound must have a long shelf-life of at least three or four weeks or even longer, which is especially important when died-out

Fig. 17. A women's casual shoe (at right, with cutaway at left) made on internal-pressure direct molding machine. Sole has solid tread portion with blown portion filling internal section of sole above it

blanks are shipped from a rubber mixing plant to a separate shoe manufacturing plant. Further assurance of adequate shelf-life is obtained when died-out blanks

TABLE 3. TYPICAL PRODUCTION FORMULAS FOR LOW EXTERNAL-PRESSURE MACHINE USE

Compound 1		Compound 2	
Flat bark crepe	50.00	Smoked sheets	66.00
SBR 1502	50.00	SBR 1502	34.00
Endor*	1.00	Accelerator 552*	.63
Zinc oxide	3.00	MBTS	1.23
Zeolex 23†	50.00	Guantal¶	1.23
Red iron oxide	3.00	Zinc oxide	7.60
SRF carbon black	1.00	Titanium dioxide	27.00
Carbowax 6000‡	1.50	Whiting	54.00
Stearic acid	1.00	Zeolex 23	13.50
Antioxidant	1.00	Suprex Clay	54.00
Retarder	1.50	Ultramarine blue	.30
Coumarone resin	15.00	Solka Floc BW-40	10.80
Process oil	20.00	Retarder	.13
Sulfur	2.75	Antioxidant	.75
MBTS	1.00	Carbowax 4000‡	.16
DOTG	1.50	Staybelite resin**	5.40
Monex§	.60	Process oil	17.30
Sodium acetate	5.00	Sulfur	2.47

Compound 3	
SBR 1502	70.00
Flat bark crepe	30.00
Velsicol #30††	12.00
Suprex Clay	60.00
Zeolex 23	40.00
Zinc oxide	5.00
Stearic acid	2.00
Micro-crystalline wax	1.50
Antioxidant	1.00
Yellow oxide	4.50
Red iron oxide	1.20
EPC carbon black	.15
Amax‡‡	1.50
Methyl Tuads‡‡	.50
Methyl Zimate‡‡	.50
Triethanolamine	1.50
Reogen‡‡	2.00
Process oil	8.00
Sulfur	2.50

* E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
† J. M. Huber Corp.
‡ Union Carbide Corp., New York.
§ Naugatuck Chemical.
¶ Monsanto.
‖ Brown Co., New York.
** C. P. Hall Co., Akron.
†† Velsicol Chemical Corp., Chicago, Ill.
‡‡ R. T. Vanderbilt Co.

Fig. 18. Direct molded men's casual with cloth upper made on low external-pressure machine

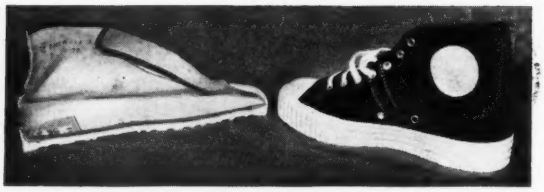


Fig. 19. Basketball shoe made using direct molding process with sole compound similar to that in Table 6

are shipped in refrigerated trucks, or cold storage rooms are provided in the rubber plants and shoe factories.

Table 3 shows typical actual production formulas. All cure approximately four minutes using a 12 iron (¼-inch) sole with heated last, side rings, and base mold at temperatures from 300 to 320° F. All compounds are good flowing, low Mooney stocks (20/25 M/L 212° F.) with Mooney scorch (MS/250° F.) times of 2½ to 5 minutes for a 3 to 5 point rise. Figure 18 shows typical footwear with sole made with the type of compounds in Table 3.

Table 4 gives an indication of typical high external-pressure compounds. These compounds may be modified for use in work shoes with cork soles. The SBR 1502 and crepe based formula will cure in 12 minutes at 320° F. under normal handling, or in eight minutes at 320° F. if the compound blank is preheated by radiant heat. The compound using SBR 1057 and SBR 1778 will also cure in 12 minutes at 320° F.

Two compounds representative of basic types being used in Germany for transparent-type soles in high external-pressure direct molded footwear are shown in Table 5. These compounds are reported to cure in 12 to 15 minutes at 155 to 160° C. for compound A and nine minutes at 165° C. for compound B, with approximately 100° C. being applied on the lasts. The German practice calls for well-peptized rubber to a low Defo (Mooney) reading.

Formulas in the tables must generally be modified to meet local conditions. Typical modifications are:

1. Increase hardness and/or stiffness by addition of high styrene resin.
2. Costs may be reduced by (a) increased pigment loading, (b) judicious use of reclaim and/or ground vulcanized scrap.
3. Improve quality with proper balance of silicate or silica pigments.
4. Readjustment of accelerator combinations and oil and resin contents may very well be necessary during the summer months to eliminate scorch and sticking-to-mill roll troubles.

The formulas in Table 6 for basketball shoes and sneakers have low Mooneys (12/15 ML 250° F.) that are necessary for fast flow in this type of footwear—Mooney scorch 13 and 9 minutes, respectively, for a five-point rise (MS/250° F.). These actual production formulas may serve as basis to tailor a formula to meet local conditions and costs. Figure 19 shows a basketball shoe made with formula similar to that in Table 6.

TABLE 4. COMPOUNDS USED FOR WORK SHOES MADE BY DIRECT MOLDED PROCESS

Compound A		Compound B	
SBR 1502	50.00	SBR 1057	30.00
Flat bark crepe	50.00	SBR 1778	55.00
Sodium acetate	.50	Flat bark crepe	30.00
Endor	1.00	Pliolite Resin*	25.00
Zinc oxide	3.00	RPA #3 conc.†	2.00
Zeolex 23	50.00	Pepton 65‡	2.00
Suprex Clay	25.00	Zinc oxide	5.00
Red iron oxide	3.00	Zeolex 23	30.00
SRF carbon black	1.00	Hi-Sil 233§	17.50
Stearic acid	2.00	Whiting	25.00
Carbowax 6000	1.50	Magnesium oxide	10.00
Antioxidant	1.00	Red iron oxide	4.50
Coumarone resin	15.00	EPC carbon black	1.80
Retarder	1.50	Antioxidant	1.00
Process oil	20.00	Stearic acid	1.00
Sulfur	3.00	Carbowax 6000	2.25
MBTS	1.00	Process oil	15.00
DOTG	1.50	Sulfur	3.00
Methyl Zimate	.75	MBTS	1.35
10/20 cork	12.00	DOTG	1.90
		Methyl Zimate	1.00

* Goodyear Tire & Rubber Co., Akron, O.
† Du Pont.
‡ American Cyanamid Co., Bound Brook, N. J.
§ Columbia Southern Chemical Corp., Pittsburgh, Pa.

TABLE 5. FORMULAS FOR TRANSPARENT-TYPE COMPOUNDS USED IN GERMANY FOR DIRECT MOLDED FOOTWEAR

Compound A		Compound B	
Smoked sheets	100.00	Pale crepe	100.00
Duranit 30	10.00	Process oil	5.00
Zinc oxide (active)	15.00	Zinc oxide (active)	1.00
Benzoic acid	2.00	Stearic acid	1.00
Sulfur	2.50	Sulfur	3.00
MBT	1.20	Paraffin wax	.50
DPG	.50	Antioxidant	1.00
Thiuram MS*	.50	Ultrasil VN 3†	25.00
Rosin	3.00	Magnesium carbonate	30.00
Clay	60.00	Hexa	1.00
Calcium silicate	30.00	Santocure‡	1.60
Mineral oil	2.00	Ethyl Zimate	.40
Rubber	3.00	Retarder	.50
Antioxidant	1.20		
Red iron oxide	4.00		

* E. I. du Pont de Nemours & Co., Inc.
† Henley & Co., New York, N. Y.
‡ Monsanto.

TABLE 6. BASKETBALL SHOE AND SNEAKER SOLE COMPOUND FORMULAS

Basketball Shoe		Sneaker	
#2 Crepe	125.00	SBR 1502	75.00
Solka Floc	5.00	#3 Thin crepe	25.00
Zinc oxide	7.00	Velsicol #30	12.00
MBTS	2.00	Zeolex 23	55.00
DPG	1.00	Suprex Clay	50.00
Esen*	.75	Zinc oxide	5.00
Titanium dioxide	50.00	Stearic acid	1.25
Ultramarine blue	.44	Antioxidant	1.00
Sunproof wax	.75	Titanium dioxide	16.00
Laurex*	1.00	Ultramarine blue	.25
Clay	50.00	MBTS	1.20
Whiting	50.00	Methyl Zimate	.54
Process oil	45.00	Triethanolamine	2.00
Millrex†	5.00	Process oil	40.00
Sulfur	3.75	Sulfur	2.70

* Naugatuck Chemical.
† Malrex Chemical Co., Malden, Mass.

TABLE 7. COMPOUNDS DESIGNED FOR USE IN THE MANUFACTURE OF ARMY COMBAT BOOTS BY THE DIRECT MOLDING METHOD

Compound A		Compound B	
Paracril OZO*	100.00	Chemigum 600¶	100.00
Turgum S†	3.00	Pliovic S-70¶	43.00
Octamine*	1.00	Mark XI stabilizer‖	.78
Zinc oxide	3.00	XX stabilizer‖	.39
Hi-Sil 233	55.00	Zinc oxide	3.00
EPC carbon black	3.00	Stearic acid	1.00
Stearic acid	1.50	Zeolex 23	30.00
Sunproof Jr.*	1.00	Hi-Sil 233	40.00
Synthetics L-1‡	20.00	HAF carbon black	3.00
MBT	1.50	Durez 12687**	10.00
MBTS	.50	Cumar MH 2½††	15.00
DOTG	.50	Carbowax 6000	2.00
Methyl Zimate	.50	Wing-Stay T¶	1.00
Sulfur (Spider)§	1.50	Plasticizer SC‡‡	10.00
		KP 140§§	10.00
		Synthetics L-1	10.00
		Amax	1.00
		Methyl Zimate	1.00
		Sulfur (Spider)	1.50

* Naugatuck Chemical.
† J. M. Huber Corp.
‡ Hercules Powder Co., Wilmington.
§ Olin Mathieson Chemical Corp., Baltimore, Md.
¶ Goodyear.
‖ Argus Chemical Corp., Brooklyn, N. Y.
** Hooker Electrochemical Co., Niagara Falls, N. Y.
†† Allied Chemical Corp., New York.
‡‡ Harwick Standard Chemical Co., Akron.
§§ Food Machinery & Chemical Corp., New York.

Preparation of Blanks

The preparation of sole and heel blanks or "slugs" for low- and high-pressure direct molding also varies from plant to plant, particularly depending on the equipment available. For example, blanks may be died-out from mill slabs, calendered, or tubed stock, or by other special means.

In open mill mixing it is customary to batch-off slabs to the required thickness from the mixing mill. With properly designed compounds and adequate cooling water a satisfactory job can be done. Sole and heel blanks are died-out from the batched-off slabs.

Some blanks are died-out from calendered slabs. In calendering it is most important that compound input and output be closely controlled. Since stock is from a warm-up mill the calender should be strip-fed to minimize scorch. Tubing rectangular blanks has been successfully employed, but only to a limited extent.

A properly balanced Coulter[1] punch set-up offers a splendid medium for processing sole and heel blanks. In this type of operation the low-compound plasticities prevent too much temperature build-up on the warm-up mills, and the return of the died-out strip to the warm-up mill makes for fast and safe handling of unvulcanized scrap.

Even with properly designed compounds it is quite possible that seasonal compound adjustment may be necessary to eliminate sticking to the mill roll or to reduce scorch tendencies during the hot summer months. Reduction of plasticizer content, or substitution of a less tacky plasticizer, will generally eliminate mill roll sticking. To reduce scorch tendency, revising the amounts of primary accelerators or a slight reduction of the secondary accelerator helps materially.

Molding Procedure

INTERNAL PRESSURE. In the molding operation the upper is usually string-lasted on the metal last. The rubber blank (with or without solid tread rubber) which only partially fills the mold, and the filler, if any, are placed into the mold cavity. During vulcanization the lasted upper is firmly held in place mechanically on the rim of the mold cavity. The curing cycle may be from 6 to 12 minutes at 300 to 320° F.

EXTERNAL PRESSURE. In principle both high and low external-pressure machines operate basically in the same manner. External pressure is applied to the unvulcanized rubber blank or biscuit, by pneumatic or hydraulic equipment, varying primarily in the total amount of pressure generated. Time, temperature, and pressure are all accurately and automatically controlled.

In low-pressure machines, operating usually on other than leather uppers, the last is electrically heated, as well as the side rings (or molds) and the base mold. In high-pressure molding, usually with leather uppers, only the side molds and base mold are heated.

The low-pressure curing cycle may be as low as two or three minutes, with an all-over thin sole; no added heel height. Usually cures run from four minutes on 12 iron (¼-inch) women's casuals, to eight minutes on 24 iron (½-inch) men's cloth uppers. Vulcanizing temperatures range from 300 to 320° F.

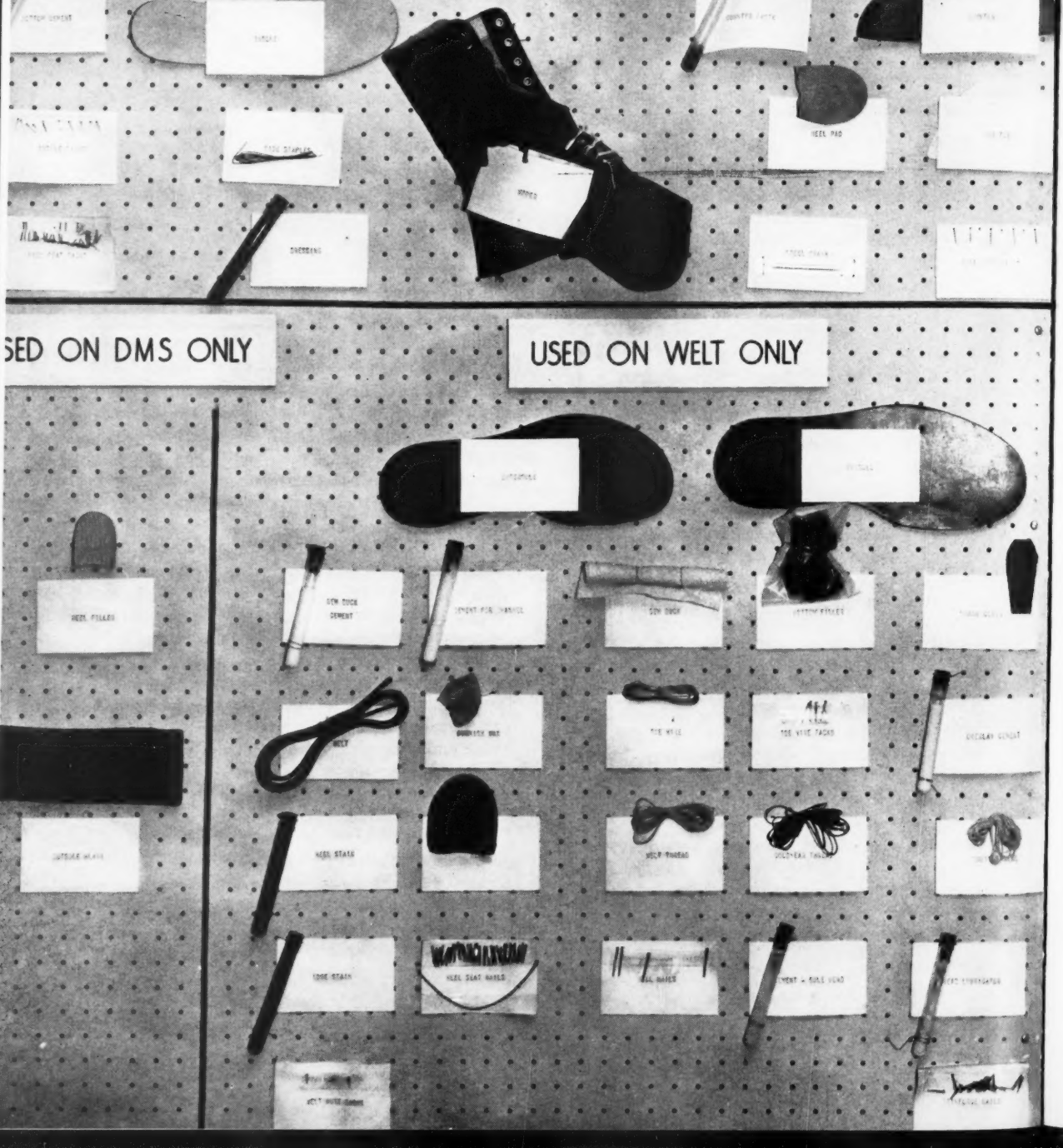
High-pressure curing cycles (no heat in last) range from 12 to 15 minutes on men's work shoes, U. S. Army boots, and men's dress shoes.

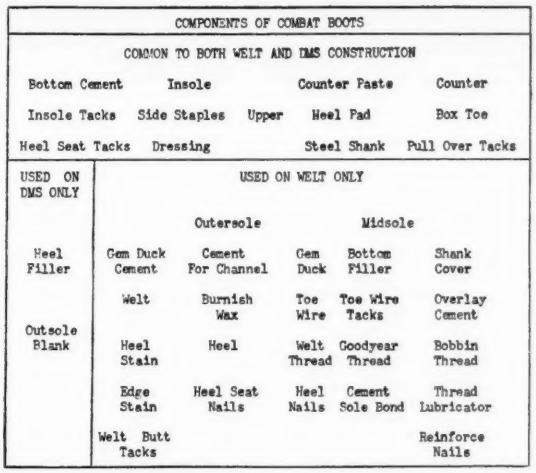
PREHEATING. In order to increase machine efficiency

[1] The James Coulter Machine Co., Bridgeport, Conn.

and man output, considerable thinking and experimental work have been done on preheating unvulcanized rubber sole and heel blanks. The potential savings are obvious and considerable. Preheating cer-

Fig. 20. An indication of the number of components eliminated by direct molding is shown in this comparison of parts and materials for an Army combat boot made conventionally or by direct molding. Direct molding (DMS) requires the common parts at top plus the two parts at lower left; while conventional construction (welt) requires the common parts plus all of the parts shown in the lower right section





Identification of parts, Fig. 20 *(facing)*

tainly appears to be a logical development which sooner or later will become an accepted fact.

Some installations of radiant heat panels have, reportedly, on a small production basis actually made it possible to reduce cures on men's work shoes from 12 minutes to eight minutes.

The following quote from a letter from C. E. Webb, research director, Pussyfoot Products, rubber division, C. & J. Clark Ltd., England, indicates considerable attention is being given to preheating in England.

"There is a marked interest in using some form of preheating to shorten the time of cure required in the vulcanizing machines. At the moment, ordinary hot air heating of blanks is being employed, and cure times of 10 minutes can be cut to 7 minute preheat at 100° C. and 7 minute cure in the machine. Attempts to use radio-frequency heating have not so far been very successful."

Special Developments

DIRECT MOLDED U. S. ARMY BOOT. It is interesting to note that a new and better boot for the U. S. Army is now being developed by footwear technologists at the Quartermaster Research & Engineering Center at Natick, Mass., by the direct molded footwear method. A considerable number of direct molded shoes is already on actual field tests over a wide geographical area.

To quote Dr. S. J. Kennedy, chief, Shoe, Leather & Textile Section, Research & Development, U. S. Quartermaster, "The compound required is expected to be non-marking, oil resistant, highly resistant to abrasion, and within a narrow range of hardness. Of the materials examined in our tests, this combination of properties appears to be available only in a few compounds, such as nitrile rubber, or their blends with poly-(vinyl chloride). Such a boot will (1) possess greater durability and longer serviceability, (2) eliminate field repair and maintenance, a very considerable item of expense resulting in (3) lower cost per pair, (4) make possible an improved traction sole, and (5) possess a high degree of water impermeability."

Some compounds typical of those being submitted for testing in this program are shown in Table 7. Figure 20, "Components of Combat Boots," shows graphically the reduction in component parts in a direct molded boot as compared to a conventional Goodyear welt combination.

NEW DEVELOPMENT IN LEATHER FOR DIRECT MOLDED FOOTWEAR. In preparing a leather lasted upper shoe for direct molding it is necessary to roughen the leather overlap (lasting allowance) on the insole. Then it is necessary to cement the roughened surface because rubber will not bond well to a regular leather finish.

Foreign leather tanners recently introduced a specially treated chrome leather which does not require roughing or cementing. The German version is called Eukanlobinder GG Spezial. This particular leather develops bond strength when directly bonded to rubber which is stronger than the leather itself.

In the United States, the Chemtan Co. Exeter, N. H., has developed an upper leather which reportedly is firmly vulcanized to rubber without roughing and cementing. If successful, this type of upper leather will contribute more savings and economies in the manufacture of direct molded footwear.

Microcellular Sole Process

Until quite recently it was generally conceded that it was impractical to mold microcellular bottoms on the present direct molded equipment. It now appears however, that definite progress has been made toward the molding of microcellular rubber by the direct molded method. Mr. Webb again writes, as follows, July 22, 1959:

"With regard to your inquiries concerning direct molded microcellular footwear, you will be interested to know that shoes are now in production using the new C. I. C. (Cema) machine and that initial wear tests are proving very satisfactory.

"The method of producing microcellular rubber by direct molding involves the same procedure (referring to regular slab production), but all stages are completed continuously in the same mold. Pressure is applied initially, and the sole mold is lowered at a predetermined rate."

So it is evidently a *fait accompli:* "They said it couldn't be done."

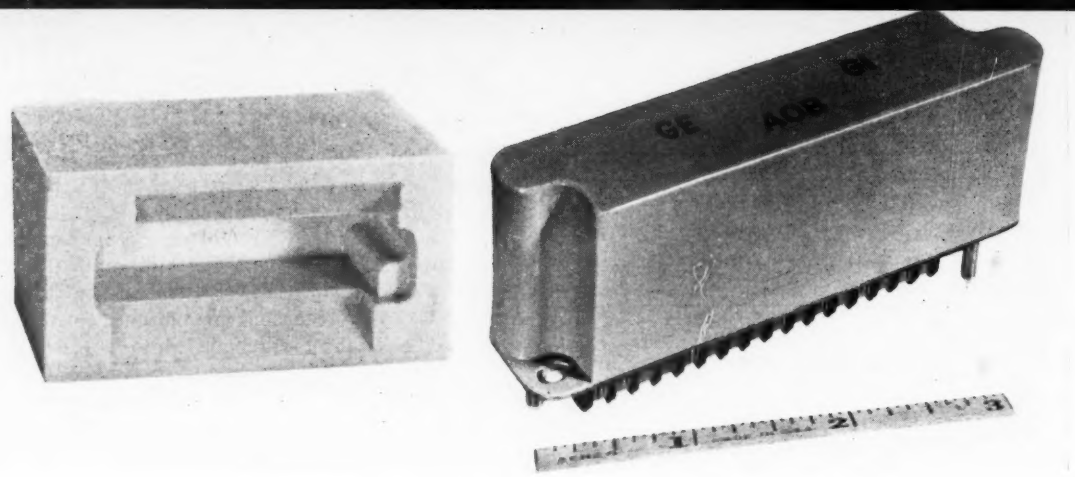
More recent information indicates Russia is actually manufacturing direct molded microcellular footwear, and British United, Desma, and Goliath machines may now be equipped to produce this type of shoe.[2]

Summary and Conclusions

Within a few short years, direct molded footwear has gained for itself a permanent place in American shoemaking. DMS has proved to be perfectly adapted

(Continued on page 564)

[2]For details of "Machinery and Equipment" for "Direct Molded Footwear," see Part I, our Dec., 1959, issue, p. 375.



Mold of RTV silicone rubber (*left*) for curing epoxy resin components (*right*)

RTV Silicone Rubber Molds for Epoxies

By E. O. TUTTLE
General Electric Co., Burlington, Vt.

IN MANY potting, encapsulating, and casting applications of epoxy resin systems, the molds are generally made of fabricated or cast metallic materials and often remain a permanent part of the assembly. This practice is not only costly, but makes it difficult to observe the appearance of the final molded product. The use of molds made of RTV (room-temperature vulcanizing) silicone rubber eliminates this difficulty and results in a lower-cost product. Of even greater importance is the fact that silicone rubber molds can be made in a relatively short time compared to the days or weeks required for making metallic molds. In addition, a part or identification number can be incorporated also in the silicone rubber mold, thus eliminating the use of nameplates and a fastening operation for the nameplate.

Room-temperature vulcanizing silicone rubbers, RTV 20 and RTV 60, of General Electric Co., and RTV 501, of Dow Corning Corp., have been used successfully in the laboratory of the missile and space vehicle department of General Electric at Burlington, Vt., for the preparation of molds for epoxy resin systems. The manufacturer's instruction for mixing, pouring, and use of catalysts with these silicone rubbers were followed. The viscosity of the silicone rubbers may be lowered for easier pouring by modification with silicone fluids; such modification, however, will change the physical properties of the cured material, especially the durometer hardness. RTV silicone rubber vulcanizates are self-releasing and are released easily from undercuts and protrusions.

A container of wood or similar material is used to confine the RTV silicone rubber around the master model in preparing the mold. The reproduction of these silicone rubbers is very satisfactory, and the transfer of letters, numbers, or other fine details to the mold is accomplished by first brushing the rubber on the area to be reproduced; then the remainder of the material is poured around the master model. If necessary, entrapped air may be removed by a vacuum. The wall thickness of the silicone rubber mold will be governed by the size, volume and configuration of the part to be molded.

The mold may be cured at room temperature, or the cure may be accelerated by curing in a hot-air oven at elevated temperatures. The final cure should be carried out at temperatures which exceed the temperatures at which the mold will be used, and the peak exotherm of the epoxy resin system to be used with the mold will dictate the securing temperatures. The mold should be brought to room temperature after curing before the master model is removed from it. Any flash or irregularities should be trimmed from the exterior of the mold so that it will be fairly square and level.

The shrinkage of the RTV silicone rubber is 1% or less, and specimens with a tolerance of 0.11-inch have been molded. If the epoxy resin system is oven cured in stages, it is desirable to remove the molded component from the mold before the final stage, if possible. If the silicone rubber mold is incompletely cured, especially in thick walled sections, or is used at a temperature higher than that at which it was cured, release of the molded material may be difficult and in some cases may cause tearing of the mold. The mold should be cleaned of any residue before reuse.

These silicone rubber molds have been used for 10 cycles at this laboratory and with proper care should have an even longer service life with the epoxy resin systems. The use of these molds has resulted in considerable cost savings, especially in short production runs and in research and development work.

MEETINGS and REPORTS

Southern Group Hears about Materials and Machines

The fall meeting of the Southern Rubber Group, which was held at the Peabody Hotel in Memphis, Tenn., October 9 and 10, included a panel discussion on the afternoon of October 9, entitled "Materials and Process Control," and a talk on the morning of October 10 on "Basic Modern Processing Equipment for the Rubber and Plastics Industries." There was a Suppliers' Hospitality Hour before the banquet on the evening of October 9, and a business meeting of the Group preceding the panel discussion on the afternoon of the same day. Registration for the meeting was 205, and about 215 were present at the banquet.

Business Meeting

Group Chairman Eldon H. Ruch, Firestone Tire & Rubber Co., presided over the business meeting, and R. L. Turpen, Bowling Green Rubber Co., chairman of the auditing committee, first reported that the Group's books were in order; then Treasurer Martin Samuels, Copolymer Rubber & Chemical Corp., stated that somewhat more than $2,000 was in the treasury as of October 1, 1959.

Mr. Ruch appointed a nominating committee for the selection of candidates for the next election of officers, headed by Warren S. Hall, C. P. Hall Co., and announced also that a committee will be appointed to review the by-laws and to make any changes in them that may be considered necessary. In addition, it was announced that the location of the 1960 June meeting had been changed from Atlanta, Ga., to Birmingham, Ala.

Other committee chairman for the 1959-60 year include: membership, R. N. Golden, Sun Oil Co.; program, Roger Pfau, Texas-U.S. Chemical Co.; education, J. P. McKenzie, Copolymer Rubber; and publicity, C. H. Edwards, Phillips Chemical Co.

Most recent past chairman of the Group, Warren S. Hall, at the conclusion of the business meeting, was presented with a gavel in recognition of his services.

"Materials and Process Control"

Jeff W. Hart, Firestone, was moderator of the "Materials and Process Control" panel discussion and after a brief introduction called first upon E. W. Kiel, Goodyear Tire & Rubber Co., who spoke on **"Preparation and Handling of Rubber Compounds."**

Mr. Kiel discussed equipment for mixing, plasticizing, weighing, and handling rubber compounds, with some comments on the advantages and disadvantages of some of this equipment. With regard to internal mixers, the Banbury is by far the most widely used, but the speaker called for further improvements in provisions for maintenance, temperature control, and reduction of wear on internal parts. The establishment of proper maximum and minimum clearances between the rotor and the mixer chamber and even between the ram and the throat is urgently needed for most efficient Banbury operation, it was said.

Although several mixing extruders have been designed which would permit continuous instead of batch operations, the difficulty in obtaining good mixing without too great temperature rise, and while still maintaining satisfactory machine capacity, has limited the application of such machines to relatively low output operations.

Plastication of rubber can be accomplished in the Banbury as effectively as in the Gordon plasticator, and use of the former for this purpose makes possible fuller utilization of equipment since the plasticator is not designed for use as a mixer. There is a real need, however, of a thorough and rapid means of preheating whole bales of rubber on their way to the Banbury.

The use of automatic weighing and conveying equipment for rubber and compounding ingredients is increasing in the industry since increased accuracy of weighing and output per man-hour are attractive features of such installations. A pelletizer converts rubber into a form convenient for handling with automatic devices and easily transferrable by vacuum or air-pressure systems. The use of pelletized rubber speeds up Banbury operations, and pellets may be fed directly on to warm-up mills for tread extruders or calenders.

Mechanization and automation help assure the continuous manufacture of products of specification quality, this speaker said in conclusion.

The next speaker was Robert H. Zabel, E. I. du Pont de Nemours & Co., Inc., and his subject was **"The Pigmentation of Rubber."** Although the main theme of this discussion was the use of pigments to impart color to rubber compounds, it was pointed out that some pigments such as carbon black, zinc oxide, and clays serve other primary purposes, and that their use as color pigments is secondary.

Color pigments for rubber are divided under the two broad categories of organic and inorganic, and typical examples of both categories in the usual

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Panel on "Materials and Process Control"

range of colors were given. Any pigment suitable for rubber must exhibit ease of dispersion, high strength, brilliance, good lightfastness, resistance to various types of cures, good chemical and bleed resistance. The performance of several of the organic pigments with regard to most of these properties, when used in a natural rubber compound, was given.

In comparison with organic colorants, the inorganic pigments lack color intensity, and for this reason where decorative effects are of prime importance, the organic pigments are preferred even though their costs may be somewhat higher, it was said.

In connection with the white pigment, titanium dioxide, which is available as anatase and rutile types, the former enjoys the wider usage even though the latter offers distinct advantages in strength, opacity, lightfastness, and cost. Data were presented to show that rutile titanium dioxide can be substituted for anatase in a natural rubber white sidewall stock at a savings of about 18% of the white pigment cost; or if an equal amount of rutile type is used, a shorter, higher temperature cure can be employed. Greater consideration should be given the rutile titanium dioxide pigments in selecting white pigments for rubber in view of their improved performance properties and potential economies, Mr. Zabel concluded.

E. J. Valois, Texas-U.S., discussed **"Gel Formation in SBR."** He pointed out that the benzene-insoluble material known as "gel," which is formed during polymerization or during the breakdown on mixing of the finished SBR, is of considerable concern in connection with the overall utility of this polymer.

A method has been devised for checking the amount of loose and tight gel in SBR. Gel which remains insoluble after ten refinings on a cold laboratory mill is called "B-Gel"; that which disperses after such treatment is called "A-Gel."

"A" or loose gel does not exert too much influence on processing of SBR, but the tight or "B-Gel" makes mixing operations more difficult and lowers the physical properties of the finished vulcanizate. In certain cases such as the production of camelback, ease of extrusion and lack of shrinkage obtained by the use of high "B-Gel" SBR, however, can mean labor and material savings to the fabricator.

Generally speaking, high-temperature mastication in the range of 320° F. will produce tight gel very rapidly; while cold fine grinding at temperatures under 120° F. will not have this effect over extended periods of time. In addition, certain classes of stabilizers will allow fast gel formation; while others will retard gel formation for long periods of time under the same conditions. The addition of carbon black to SBR in a hot Banbury mix retards the formation of tight gel.

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J. P. McKenzie, *left*, and Frank F. McKay, Jr., *right*

Oil-extended SBR is not so susceptible to the formation of tight gel as are the rubbers that have not been extended with oil.

G. C. Maassen, R. T. Vanderbilt Co., was the final speaker of the panel, and his subject was **"Processing Control of Rubber Chemicals."** In a paper of which J. A. Sigmann, of the same company, was a co-author, the design and development of a control test to determine the dispersibility of a certain powder in rubber as both a check on the production of this powder and to improve its quality were explained. [Since a paper by Mr. Sigmann on this part of Mr. Maassen's talk appears in this issue, full details will not be reported here. EDITOR.] An important step in processing control of rubber chemicals is the design of control tests that will be used in establishing and improving the quality level of such chemicals.

Sampling is another important aspect of processing control in that it must be decided when and where a sample should be taken, and, once selected, how many replications need to be run to arrive at what level of accuracy with what level of precision. When it can be demonstrated that the quality level is a function of time, composite sampling can be introduced advantageously, but the control department must accurately determine the relation of the particular quality level in question to time. The various factors involved in deciding on the make-up of the composite sample in a case of a chemical being continuously loaded into drums was explained.

The Banquet Program

At the banquet on the evening of October 9, Roger Pfau welcomed those present and then introduced the head table before turning the program over to G. R. McCalla, J. E. Dilworth Co., who was master of ceremonies.

The Harmon Connell Scholarship award of $500 and a scroll were presented to Frank F. McKay, Jr., a senior at Mississippi State University, by J. P. McKenzie, chairman of the education committee. This award was established to honor the memory of Harmon Connell, the first chairman of the Southern Rubber Group.

The "Man of the Year" award was made to William F. Gerrow, Jr., Goodyear Tire & Rubber Co., chemical division, by Thomas R. Brown, The B. F. Goodrich Co. Mr. Gerrow received this award for his work as housing chairman for the St. Petersburg, Fla., meeting of June, 1959.

Ross Pritchard, Southwestern University, Memphis, was the after-dinner speaker. He was introduced by Mr. McCalla. Dr. Pritchard spoke on "Capitalism and National Security," and said that he felt that our national security was not all that it should be, and that capitalism was not doing the job required of it in this connection. He suggested that the United States does not understand the relation of major world problems and the cold war as well as the Soviet bloc countries, and that we are in need of even greater efforts to sell our way of life to the rest of the world in view of the progress being made by Russia with many underdeveloped countries.

Processing Equipment Review

The program on the morning of October 10 was devoted to a **"Review of Basic Modern Processing Equipment for the Rubber and Plastics Industries,"** by Everett Perlberg, Adamson United Co. This speaker included in his talk a discussion of internal mixers, mills, calenders, presses, and curing equipment other than individual tire curing presses. A large number of slides and some models were used to illustrate this presentation.

Following the generalization that new tire plants were designed around calenders and mechanical goods plants around curing capacity, a review of internal mixers was made. The kneading action of the Intermix of Francis Shaw & Co., Ltd., of England, which is handled by Adamson United in this country, was compared with the smearing or wiping action of sigma blade-type units. The advantage of mounting the rotors on fixed centers by means of roller bearings, outboard of the main housing, was pointed out. Also noted was the advantage of a large area ram in allowing variable batch sizes and permitting programming of the mixing cycle by means of pressure regulation.

The drop-type gate, which permitted some leakage of the mix, was compared with a slide gate, which produced "rat-tails." The probability of single-pass mixes in new-style intensive mixers where breakdown of the rubber, mas-

terbatching, addition of oils and plasticizers, and finally curing agents could be accomplished, was also reviewed.

In discussing two-roll mills, mention was made of integral base design where end-frames and bedplate are incorporated as an integral casting, and with the use of vibration dampeners, expensive foundations and anchor bolts can be eliminated. Mills built utilizing this principle can be removed from an existing site with a minimum of difficulty. Drilled rolls with circulating water systems, flood lubrication, labyrinth seals, individual rather than line shaft drives, and designing connecting gears for adjustable openings were also discussed.

In reviewing calenders, the speaker pointed out that "Z"-type calenders were built as early as the late 1800's. The use of roll bending and roll crossing for obtaining improved uniformity of gage was covered in some detail. Progress in calender design since World War II was reviewed, including roll temperature control, individual screwdowns, beta ray gage control, flood lubrication, bearing temperature control, and constant-tension variable-speed d.c. drives.

Emphasis was placed on proper calender design such as the 120-degree calender with its safety and gravity feed advantages as a three-roll unit and "Z"-type calenders for double coating. The possibility of a five-roll unit, which could be an "L" or "Z" type, was mentioned. The speaker emphasized the mistake of buying three-roll calenders when only a two-roll unit was needed.

Curing equipment, with special emphasis on continuous vulcanization units and tank-type vulcanizers, was reviewed next. Special emphasis was placed on safety in design of quick-opening doors with the flange and groove arrangement, as used in the patented "Lift-Swing" door or the side-slide, or straight up, or up-and-over design shown to be much safer than a breech-lock type of door.

In a discussion of presses, continuous, rotary curing units such as the "Gora-Lee," the Ferris-Wheel design of Adamson United Co., and other rotary units were mentioned. The "Rotocure" built under license from the Boston Woven Hose & Rubber Co., division of American Biltrite Rubber Co., was described, including the basic design, means of adding more heat, the use of a secondary pressure role, and the two-band machine.

New developments in flat-bed press design were reviewed with reference to the development of the curved side-plate or "barrel" press for high-density molding and for high clamping pressures for transfer molding. Advantages and disadvantages of automatic presses including those of the mechanical crank-type were discussed.

This very informative review concluded with a description of the "squat-heater," the new single-mold heater press for large tires, and the possible in-field future use of the equipment for recapping and rebuilding of off the road tires at the site.

Les Cooper

S. Everett Perlberg

RIRC Hears Morrow

The regular fall meeting of the Rhode Island Rubber Club was held at the Pawtucket Country Club on November 5, with 173 members and guests in attendance. At the predinner technical meeting the Club was addressed by John E. Morrow, Sun Oil Co., who spoke on "A Guide to the Selection of Rubber Processing Oils." A brief summary of the informal talk follows.

Mr. Morrow discussed the three types of oils currently available for rubber processing — paraffinic, naphthenic, and aromatic — and the means by which they are produced. He then outlined their chemical composition pertaining to molecular structure. Paraffinic oils are oils that have a predominant number of paraffin-chain carbons (50% or more C_p); naphthenic oils have a large number of naphthene ring carbons (30 to 45% C_n); and aromatic oils have a large number of aromatic ring carbons (35% or more C_a). The speaker then showed his audience the procedure by which the chemical composition can be determined, knowing only the viscosity gravity, and refractive index of the oil. The talk was concluded by showing how some of the properties of the finished rubber compound are affected by oil composition.

After-dinner speaker was Arthur A. Dunn, assistant to the president of State Mutual Life Assurance Co. of America, who discussed "Human Relations on the Job."

Election of officers for the coming year was held with the following results: chairman, Harry L. Ebert, Firestone Rubber & Latex Products Co.; vice chairman, Walter Blecharczyk, Davol Rubber Co.; secretary-treasurer, Edwin S. Uhlig, United States Rubber Co. The board of directors includes Ralph B. Robitaille, Phillips Petroleum Co.; Joseph Vitalle, Crescent Wire Co.; C. A. Damicone, Acushnet Process Co.; Joseph M. Donahue, Goodyear Tire & Rubber Co.; and Paul Hastings, Kleistone Rubber Co., Inc. Permanent historian is Roy G. Volkman, U. S. Rubber. Past chairman of the Club is H. Webster Day, E. I. du Pont de Nemours & Co., Inc.

Fort Wayne Meeting

The second meeting of the 1959-1960 season of the Fort Wayne Rubber & Plastics Group was held in the ballroom of the Van Orman Hotel, Fort Wayne, Ind., December 3. A delicious smorgasbord dinner was enjoyed by 173 members. Preceding the dinner there was an Oyster Bar through the courtesy of O'Connor & Co., Chicago, Ill.

There was a panel discussion of reclaimed rubber, its manufacture, uses and advantages, with special attention being given to new developments in this important industry. Most of the material covered in this symposium has been previously reported.[1] Moderator was Don L. Zimmerman, chief chemist for footwear, auto mat, Ensolite, and heavy extrusion divisions of United States Rubber Co.

Panel members were: John M. Ball, sales representative, Midwest Rubber Reclaiming Co., whose subject was "What Is Reclaimed Rubber and How Is It Made?"; Paul J. Mester, reclaim research and development manufacturing, Naugatuck Chemical Division, U. S. Rubber, discussed "What Types of Reclaimed Rubber Are Available?"; W. R. Macy, senior product engineer, B. F. Goodrich Co., whose topic was "How Is Reclaimed Rubber Used in Tires and Other Transportation Items?"; John E. Brothers, chief chemist for Ohio Rubber Co., whose subject was "What Are the Merits of Reclaimed Rubber in Molded Goods and Other Non-Transportation Items?"; G. Croft Huddleston, sales representative for U. S. Rubber Reclaiming Co., Inc., whose topic was "What Are the Major Reasons for Using Reclaimed Rubber?"; John E. Misner, development engineer for Xylos Rubber Co., whose subject was "What Are Premixes and How Can They Best Be Used?" A question-and-answer period followed the panel.

The next meeting will be held on February 11, 1960, at the Van Orman Hotel, Fort Wayne, Ind.

[1] See RUBBER WORLD, Sept., 1958, p. 892.

ISO/TC 45 on Rubber Completes Full Program at New York Meeting

The eighth meeting of Technical Committee 45 on Rubber of the International Organization for Standardization, hereinafter referred to as ISO/-TC 45, was held in New York, N. Y., at the Henry Hudson Hotel, October 26-31, 1959, with the American delegation as hosts. The ISO General Secretariat is located in Geneva, Switzerland, from which office the general activities of 95 technical committees dealing with industrial, commercial, engineering, and safety standards for many materials, processes, and products are handled by this non-governmental body. The Secretariat for ISO/TC 45 is handled by the British Standards Institution in London, England, which manages and records specific activities in the rubber field.

The American Standards Association, New York, is the official member of ISO/TC 45. The American delegation, however, is made up from the officers and subcommittee chairmen of Committee D-11 on Rubber and Rubber-like Materials of the American Society for Testing Materials, as requested by ASA.

New York Meeting Details

The New York ISO/TC 45 meeting was attended by about 75 delegates from Canada, France, Germany, Italy, India, Netherlands, Sweden, United Kingdom, United States of America, and the Union of Socialist Soviet Republics.

The opening session on the morning of October 26 heard first from Admiral G. F. Hussey, Jr., managing director of ASA, who welcomed the delegates on behalf of the United States and then introduced J. M. Buist, Imperial Chemical Industries, Ltd., as chairman of the meeting.

Mr. Buist thanked Admiral Hussey for his welcome and paid tribute to certain leaders of delegations and others not present at the New York meeting.

The program included meetings of 16 working groups and four plenary sessions. There was a trip to Bell Telephone Laboratories in Murray Hill, N. J., on the afternoon of October 28, and The Rubber Manufacturers Association, Inc., was host at a cocktail party and banquet on the evening of October 29 at the Henry Hudson.

The planning and local arrangements committee for this meeting was headed by H. G. Bimmerman, E. I. du Pont de Nemours & Co., Inc., and vice chairman of ASTM Committee D-11; other members were J. J. Allen, Firestone Tire & Rubber Co., and D-11 secretary; Simon Collier, Johns-Manville Corp., and D-11 chairman; the late S. R. Doner, Raybestos-Manhattan, Inc.; F. C. Frost, ASA; R. G. Seaman, RUBBER WORLD; R. D. Stiehler, National Bureau of Standards and leader of the American delegation; G. N. Vacca, Bell Telephone Laboratories; and G. G. Winspear, R. T. Vanderbilt Co.

Resolutions Passed

It is not possible to provide a summary of all of the actions of ISO/TC 45, but from a number of draft resolutions approved at the final plenary session and brief minutes of this session, some indication of the results of the New York meeting may be gained.

Resolution A stated that Document 45N470—Draft ISO Proposal for Standard Atmospheres for the Conditioning and Testing of Rubber—will be circulated by postal-ballot to ISO/-TC 45, subject to certain editorial and other amendments.

Resolution B recommended that the Secretariat carry out as soon as possible a postal-ballot in ISO/TC 45 to determine the allocation of the convenership (chairman) of the new Product Specifications Working Group. Germany and the United States were both proposed for this post.

Proposals have been received for product specifications on rubber rings for joints for asbestos cement water piping, safety boots, foam rubber hospital mattresses, foam rubber components for furniture, foam rubber components for transport seating, rubber flooring, ebonite for general and electrical purposes, anti-static rubber components for hospitals, rubber hose, raw natural rubber, natural and synthetic latices, and raw SBR.

Resolution C stated that the terms of reference of Working Group E should be restricted to non-destructive tests to evaluate the visco-elastic properties of cross-linked elastomers under both dynamic and static load.

Resolution D recommended that Document WG 12 N 19—Method for the Determination of the Density of Latex—should be circulated for postal-ballot subject to the amendments proposed by Working Group 12 and the inclusion of a table to be supplied by the USA delegation.

Resolution E recommended that Document ISO/TC 45 (Secretariat 331) 475—Determination of Volatile Fatty Acid Number of Latex—be circulated for postal-ballot subject to the amendments proposed by WG 12.

Resolution F stated that Document ISO/TC 45 (Secretariat 330) 474—Determination of Nitrogen in Latex—should be circulated for postal-ballot approval.

Resolution G recommended that ISO/TC 45 (Secretariat 329) 473—Determination of Coagulum Content of Latex—be circulated for postal-ballot approval subject to amendments proposed by WG 12.

Resolution H asked that Document 45N389—Determination of Impact Brittleness Temperature—as modified by WG 4, be submitted to the General Secretariat as a draft ISO recommendation.

Resolution J stated that Document 45/WG 15 N 3, a second-draft ISO proposal for testing the resistance of vulcanized natural and synthetic rubbers to liquids, should be circulated for postal-ballot subject to the amendments proposed by WG 15.

Resolution L asked that Document 45 N 444, an ISO proposal for the preparation and testing of the adhesion of vulcanized rubber-to-metal where the rubber is assembled to one metal plate, be circulated for postal-ballot in the amended form suggested by WG 2.

Resolution M recommended that Document 45 N 443—the same as 45 N 444 except that the rubber is assembled to two metal plates—should be circulated for postal-ballot in the amended form suggested by WG 2.

Resolution N asked that Document 45 N 501—Revision of Table in Document 45 N 441, giving the dimensions of a small test piece and larger tolerances for the large test piece, should be circulated for postal-ballot by the Secretariat.

At the suggestion of the French delegation, it was agreed that this ballot should be accompanied by a circular letter explaining the reasons for the proposed change and that it would have no effect on the test results.

Resolution O recommended that the proposed amendements to ISO Recommendation R.48, as given in Document 45 N 507, should be circulated for postal-ballot by the Secretariat, coupled with the proposal for the microhardness test which should form a second part of R.48.

At the final plenary session on October 31, it was decided that the reorganization of the whole system of ISO/TC 45 Working Groups was necessary along the lines of Document ISO/-TC 45 (Secretariat 293) 433. The following allocation of titles and tests to the various new Groups was approved.

A. Chemical Tests
   All chemical tests and methods of analysis other than those on latex.
B. Latex Tests
   All tests on both natural and synthetic latices.
C. Unvulcanized Rubber
   Physical tests on unvulcanized rubber including sampling and tests for evaluation of the vulcanizates.
D. Physical Properties
   Stress/strain, tear, ply adhesion, hardness, bond strength, swelling, brittleness, gas permeability of vulcanizates.

E. Viscoelastic Properties
Compression set, tension set, rebound resilience, creep and stress relaxation, low-temperature modulus, and dynamic tests of vulcanizates.
F. Degradation
Aging, abrasion, flex cracking, cut growth, and dynamic ply adhesion of vulcanizates.
G. Electrical Tests and Ebonite
All electrical and all tests both electrical and physical on ebonite.
H. Flexible Cellular Materials
J. Classification of Vulcanized Rubber
K. Products
L. Terms and Definitions

It was agreed that the convener of each Work Group should decide on the priorities with respect to the work carried on by his Group.

Next Meeting

V. Zerbini, Pirelli S.P.A., leader of the Italian delegation, confirmed the invitation to hold the next meeting of ISO/TC 45 in Milan, Italy. The meeting thanked Dr. Zerbini and accepted the invitation and agreed that the meeting should take place either early in May or late in September of 1961. (It was pointed out by the Secretariat that the 1961 General Assembly of ISO will take place in Finland during the period of June 8-18, 1961).

H. Geldof, Rubber Research Institute TNO, leader of the Netherlands delegation, mentioned that there would be a meeting in Berlin in October, 1960, of the German Rubber Society. He suggested that if an invitation could be issued by the German delegation, it might be useful to have Working Group meetings at that time.

R. Ecker, Farbenfabriken Bayer AG, leader of the German delegation, said that he would be only too pleased to invite the Working Groups to meet in Berlin, but he would have to obtain a confirmation from the German Standards Organization on the matter.

It was agreed that the actual Working Groups which should meet in Berlin should be left to the discretion of the conveners and the Secretariat.

The final plenary session was concluded by Chairman Buist who thanked the United States hosts for the fine arrangements for the New York meeting and also for the hospitality which had been offered to the delegates.

A vote of thanks to the chairman was recorded for the able way in which he had conducted the meetings.

ISO/TC 45 Banquet

At the ISO/TC 45 banquet on the evening of October 29 at the Henry Hudson Hotel, sponsored by the Rubber Manufacturers Association, Simon Collier, ASTM D-11 chairman, acted as toastmaster. He extended a welcome to all present, with special greetings to the foreign delegates, and then explained the relation of the ASTM D-11 Committee to ISO/TC 45.

Mr. Collier next introduced those seated at the head table, who made brief remarks. Admiral Hussey stressed the value of the ISO work to the cause of international understanding. R. E. Hess, associate executive secretary, ASTM, mentioned that ASTM was watching with interest the work of the ISO/TC committees. Mr. Buist reviewed the progress made since the last meeting of ISO/TC 45 in the United States in 1959 in Akron, O.

Ross R. Ormsby, president, RMA, introduced the speaker of the evening, Frank K. Schoenfeld, research vice president, The B. F. Goodrich Co. Prior to Dr. Schoenfeld's address, however, Mr. Ormsby explained the purpose, organization, and activities of the RMA in this country. He told how the RMA board of directors was made up of industry executives and how the day-to-day Association activities were carried on by a permanent staff. He indicated that the several product and service divisions comprised the basic working organization of the RMA, with staff members heading up one or more of these divisions. Most of these divisions and subdivisions have separate technical committees, the members of which are recruited from industry for this type of work, which committees cooperate with similar technical committees of scientific and technical societies in developing rubber product specifications and tests.

Dr. Schoenfeld discussed the "Outlook for Man-made and Crude Rubbers—Their Importance for the Future," in his address. World rubber consumption will increase by 30% in the next five years; demand for synthetic rubber will rise 60%, and foreign synthetic rubber production will double so that by 1965, the world will be consuming rubber at the rate of 4.6 million long tons a year, it was said.

Since the transfer of the synthetic rubber industry in this country from government to private ownership, annual production capacity has increased 55% from the original 1,130,000 long tons, at a cost of millions of dollars to private producers. Production capacity for synthetic rubber in Free World countries outside the United States amounts to an estimated 335,000 tons yearly, and the speaker said he expected this capacity to "almost double" within the next three years.

Banquet of ISO/TC 45 on Rubber at Henry Hudson Hotel, New York, October 29. Top inset shows head table, *left to right:* Admiral G. F. Hussey, Jr., managing director, ASA; F. K. Schoenfeld, research vice president, B. F. Goodrich Co., and dinner speaker; Simon Collier, chairman, ASTM Committee D-11; J. M. Buist, Imperial Chemical Industries, Ltd., chairman New York ISO/TC 45 meeting; Ross R. Ormsby, RMA president; and R. E. Hess, ASTM associate executive secretary

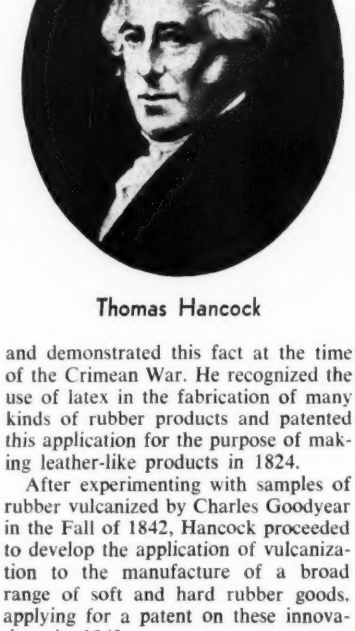
If the rest of the Free World is able to boost its synthetic rubber usage to roughly 45% of total new rubber requirements and if forecasts of Soviet bloc natural rubber demands are accurate, then the United States will have to boost its ratio from 65% now to 75-80% synthetic within just five years.

Meanwhile, the rubber goods manufacturing industry, both in the United States and in other nations, must go seriously about the job of using a rapidly increasing proportion of synthetic rubber, the speaker added.

The more rapid development of synthetic polyisoprene and polybutadiene for use in place of or as an extender for natural rubber was urged since it was felt that these materials will play an important role in the supply-demand picture for rubber before 1965. With this background, the natural rubber stockpile liquidation programs of the United States and England will not have a serious disrupting effect on the market for natural rubber, according to the speaker.

"In fact, it seems entirely possible that the release of natural rubber from these stockpiles will contribute now and in the long range to the best interests of the natural rubber industry," Dr. Schoenfeld concluded.

A booklet, "Facts and Figures Relating to the Rubber Industry," of October 30, 1959, by The B. F. Goodrich Co., was distributed in connection with Dr. Schoenfeld's talk.



Thomas Hancock

Hancock Selected for Rubber Science Hall of Fame by Akron University

Thomas Hancock, English manufacturer and inventor (1786-1865), was added to the University of Akron's international Rubber Science Hall of Fame at the annual Hall of Fame banquet held on November 20 at the Sheraton Hotel, Akron, O. He is the sixth person to achieve this distinction.

The Rubber Science Hall of Fame was established in 1958 in conjunction with the fiftieth anniversary celebration of the teaching of rubber chemistry at the University of Akron,[1] when five individuals who had made significant contributions to the science of rubber chemistry were placed in the Hall of Fame.

The 1959 selection committee was headed by Maurice Morton, professor of polymer chemistry and director of the Institute of Rubber Research at the University, and included G. Stafford Whitby, professor emeritus of rubber chemistry and consultant, Institute of Rubber Research; Arthur E. Juve and Ralph F. Wolf, both representing the Division of Rubber Chemistry, ACS.

Frank H. Cotton, prominent English educator in the field of rubber technology and head of the National College of Rubber Technology in Great Britain, was the guest speaker at the banquet. Dr. Whitby presented a paper on Hancock prior to the reading of the citation to this sixth member of the Rubber Science Hall of Fame. L. M. Baker, General Tire & Rubber Co., was master of ceremonies.

Hancock's citation reads as follows: "A manufacturer and inventor, who, because of the important part he played in the establishment of rubber manufacturing has justly been called the 'Father of the Rubber Industry'; who in the earliest days of the industry contributed machines and techniques required for the successful fabrication of rubber goods, and who, thanks to his enterprise, energy and ingenuity, greatly extended the range and variety of manufactured articles."

Dr. Whitby emphasized that Hancock's basic contributions included the designing, construction, and operation of a machine for masticating rubber and so massing and plasticating it (1820); means for converting masticated rubber under pressure, in molds, into blocks, and for cutting from sheets and blocks (1820); and a spreading machine for the application of rubber solution to fabrics (1827).

At an early period Hancock indicated an awareness of some of the unique properties of rubber and of its possibilities and problems. He was aware of the self-sealing properties of rubber and of its possibilities and problems. He was aware of the self-sealing properties of rubber against puncture and demonstrated this fact at the time of the Crimean War. He recognized the use of latex in the fabrication of many kinds of rubber products and patented this application for the purpose of making leather-like products in 1824.

After experimenting with samples of rubber vulcanized by Charles Goodyear in the Fall of 1842, Hancock proceeded to develop the application of vulcanization to the manufacture of a broad range of soft and hard rubber goods, applying for a patent on these innovations in 1843.

Dr. Cotton, speaking on "Education in Technology," said that all real knowledge is based upon past experience; therefore the role and value of practical experience is supreme as a tool of the educator.

The English distinction between technicians and technologists is that the technician is defined as "one skilled in an art, working mainly with his hands"; while a technologist is "one trained to apply scientific knowledge in manufacturing through mental processes."

The shortage of trained technologists in England during World War II resulted in an Education Ministry recommendation that national colleges in such critical areas as automotive, aeronautic, electronic, rubber, and others be formed. Today the National College of Rubber Technology is financed 100% by the British Ministry of Education.

Dr. Cotton closed his address by congratulating the University of Akron on the technological advances made by the Department of Chemistry over the last 13 years (he had previously visited the campus in 1946).

[1] RUBBER WORLD, Nov., 1958, p. 238.

Head table at Akron University's 1959 Rubber Science Hall of Fame Banquet: (left to right): H. J. Stern, consultant to rubber industry in England; Thomas Sumner, AU chemistry professor and head of department; Leslie P. Hardy, AU financial vice president; Mr. Baker; Dr. Cotton; Dr. Whitby; and Dr. Morton

Milt Leonard *(left)* ARG chairman, and W. E. Ford, dance committee chairman, both of Columbian Carbon Co., enjoying a chat with Tex Beneke *(right)* and the Beneke Orchestra vocalist during the Akron Rubber Group's first dance

Akron Dance Success

The Akron Rubber Group held its first dance on November 6 in the Sheraton Hotel, Akron, O. A large crowd turned out for the affair and filled both the main ballroom and the Ohio Room.

The Group had felt that it had complied with constitution and by-laws stated purposes of technical, educational, and recreational service to members, but that the social service had not been too well attained. This first dance was to rectify this deficiency in the year's program, and the success of the dance would seem to indicate that it accomplished its purpose.

The dance committee headed by W. E. Ford, and W. G. Kitzmiller, both of Columbian Carbon Co., arranged to have orchid corsages for each woman flown in from Hawaii. Music was supplied by Tex Beneke and his orchestra. The orchestra played many old favorites and kept the dance floor well filled all evening.

Record Boston Party

The annual Christmas party of The Boston Rubber Group was held on December 11 at the Hotel Somerset, Boston, Mass.

The officers for 1960 were introduced as follows: chairman, James Breen, Barrett & Breen Co.; vice chairman, George E. Herbert, Tyer Rubber Co.; secretary-treasurer, John Hussey, The Goodyear Tire & Rubber Co. Reelected to the executive committee were George Hunt, Simplex Wire & Cable Co.; William King, Acushnet Process Co.; and B. H. Capen, Tyer Rubber Co. The historian is Harry Atwater, Malrex Chemical Co. New member elected to the executive committee was Robert Loveland, R. T. Vanderbilt Co.

A new attendance record was set when 650 members sat down to the usual lobster or turkey dinner in the Louis IV ballroom. Guests at the head table included the chairman of the Rhode Island Rubber Club, H. W. Day, and the chairman of the New York Rubber Group, R. Carroll.

Following dinner, the Group was entertained by a floor show highlighted by the nationally famous act of Black & Nolan. Door prizes were awarded to 252 lucky ticket holders.

The next function of The Boston Rubber Group will be the annual ski week-end at Bartlett, N. H., on February 5-7, 1960.

NCRG Party/Meeting

New officers and directors for the Northern California Rubber Group were installed at the annual Christmas party held on December 5 at the Orinda Country Club, Orinda, Calif. Bernie Fuller, E. I. du Pont de Nemours & Co., Inc., succeeds Drace Kutnewsky, Burke Rubber Co., as the new president of the Group. Other officers elected were vice president, Keith Large, Oliver Tire & Rubber Co.; secretary, Don Preiss, Shell Development Co.; treasurer, Vic Carriere, Mansfield Tire & Rubber Co.; and three directors as follows: Ray Brown and Norman Burke, both of Burke Rubber, and Stan Mason, Pioneer Works, H. K. Porter Co.

Carl Mayerhauser, chairman for the party, was assisted by Gene Unterzuber, Keith Large, and Vic Carriere. Dinner, dancing, camelia corsages, and favors were enjoyed by the 75 couples attending. Twenty-five door prizes were awarded. The two main prizes, a 17-inch portable Philco television set and a Waring blender, were won by Mrs. R. C. Claussen (H. K. Porter Co.) and Mrs. J. W. MacKay (Monsanto), respectively.

November Technical Meeting

"Rubber-to-Metal Bonding" was the subject of a technical talk presented by Donald M. Alstadt, manager, Hughson Chemical Co., a division of Lord Mfg. Co., at the November 5 meeting of the Group, held at the Berkeley Elk's Club, Berkeley, Calif.

In his talk Mr. Alstadt outlined the fundamental factors operative in rubber-to-metal bonding, using polymeric agents. These agents, he stated, are replacing brass and copper plate methods. The important characteristics of a rubber to be bonded are the polarity of the base polymer, polarity changes induced by compounding, surface topography of the stock, chemical reactivity of the rubber chains, and the nature of the interfacial electrical characteristics at the adhesive layer that influence the movement and reactions of chemical cross-bridging agents.

The important factors in the adhesive system, he stated, include these same factors important in the polymer to be bonded as well as the elasto-plastic nature of the adhesive, the molecular weight of the adhesive polymer, the homogeneity of the adhesive film, the solvent present, the nature of the reinforcing pigments, and the thermal expansion of the bonding agent.

According to the speaker, the important metal qualities are the free energy of the surface, structure and thickness of natural or artificial absorbed films, the crystal orientation and free energy change produced by mechanical rolling, and the surface roughness factor.

In general, he stated, the more polar elastomers such as NBR and neoprene are more easily bonded than the nonpolar types such as SBR and natural. The secondary valence or so-called physical forces are often sufficient in

New officers of NCRG *(left to right)*, Donald M. Preiss, Stanley Mason, Raymond Brown, Bernie Fuller, Keith Large, Vic Carriere (not present when this picture was taken was Norman Burke)

the case of the former polymers to produce adequate and durable adhesion at the adhesive-rubber interface; while the latter polymers must rely on some chemical cross-bridging mechanism. Other than solubility measurements, one means of assessing the polarity of the polymers is the contact angle, the speaker added. The degree of adhesion between a polymer and liquid that wets the polymer, i.e., low contact angle, is usually higher than between a polymer and liquid which does not wet. This statement does not mean, he pointed out, that complete wetting is sufficient to give adequate adhesion, but adequate wetting and a reasonable degree of polarity must characterize the system.

In those cases mentioned where chemical cross-linking is necessary, the cross-linking agent is usually sulfur, he pointed out. The sulfur may be added to either the polymer or the adhesive or both. In any case the sulfur probably migrates to the interface and reacts to produce a chemical union between the polymer and the bonding agent.

The polymeric material in the adhesive must not only demonstrate high adhesion and low interfacial tension between itself and the rubber, but also must adhere to the metal surface which requires a reasonably high polarity, according to Mr. Alstadt.

IRC "Proceedings" From ACS, ASTM, ASME

The "Proceedings—International Rubber Conference," the more than 600-page volume of preprints of all of the papers presented at this Conference[1] which was held in Washington, D. C., November 9-13, 1959, is available from each of the sponsoring societies, according to an announcement from the International Conference Committee. The list price is $12.50 per copy, but members of the sponsoring societies may obtain copies at $10 each, postage paid.

Orders for copies of the "Proceedings" should be addressed to the following persons, depending on the purchaser's society affiliation, or if there is no society affiliation, the order may be addressed to any of the three indicated society representatives.

Mr. Geo. E. Popp, Treasurer,
Division of Rubber Chemistry,
American Chemical Society,
c/o Phillips Chemical Co.,
318 Water Street,
Akron 8, Ohio.

Mr. R. E. Hess,
Assoc. Exec. Sec'y,
American Society for Testing Materials,
1916 Race Street,
Philadelphia 3, Pa.

Mr. T. A. Marshall, Jr.,
Sen. Assist. Sec'y,
American Society of Mechanical Engineers,
29 West 39th Street,
New York 18, N. Y.

The contents of the "Proceedings—International Rubber Conference," that is, the titles and the authors of the papers included in it, may be examined in the report of the final Conference program.[2] In addition, abstracts of the papers given at the Conference appeared in the July, August, September, and October, 1959, issues of RUBBER WORLD.

Briefly, the 72 papers presented in 12 technical sessions at the Conference covered many aspects of tire design, testing, and performance; equipment and processes for rubber products manufacture; many aspects of testing and test methods; natural and synthetic rubbers and latices; elastomer reinforcement; polymers and polymer structure; and vulcanization. Much new information on all of these and other subjects was included in these papers.

[1] RUBBER WORLD, Dec., 1959, p. 392.
[2] *Ibid.*, Oct., 1959, p. 101.

SORG Yule Dance

Some 148 members of the Southern Ohio Rubber Group and their wives attended the annual Christmas party-dinner-dance on December 12 at the Miami Valley Golf Club, Dayton, O. The people were welcomed and greeted by the chairman, R. J. Hoskins, Inland Mfg. Division, General Motors Corp., who then introduced the newly elected officers.

These officers follow: chairman, Frederick W. Gage, Dayton Chemical Products Labs, Inc.; chairman-elect, Howard G. Gillette, Precision Rubber Products Co.; treasurer, Roger E. Headrick, Wright Patterson Air Force Base; secretary, Richard C. Hempelman, Premier Rubber Co. Directors, three years, are Ray Jacobs, Premier Rubber Co.; Marvin Coulter, American Zinc Sales Co.; and Jack West, Union Carbide Chemicals Co. Hold-over directors were reported thusly: directors, two years, Herbert S. Karch, C. P. Hall Co.; J. M. Williams, Amsco Chemicals; and Wm. Herberg, Dow Corning Corp. Directors, one year, are: Frank Bell, B. F. Goodrich Chemical Co.; Wm. Nolan, Inland Mfg.; and Reuben Wolk, Dayton Rubber Co. The director ex-officio for one year is R. J. Hoskins, because he is immediate past chairman.

At the dinner-dance, preceded by a cocktail hour, those in attendance enjoyed the music of the Paul Little Combo. There were 90 door prizes, and a gift for each lady, purchased from funds donated by the suppliers.

CALENDAR

January 19
Elastomer & Plastics Group, Northeastern Section, ACS. Science Park, Boston, Mass.

January 21
Quebec Rubber & Plastics Group. Joint Meeting with Society of Plastics Engineers Extrusion. Ruby Foos, Montreal, P.Q., Canada.

January 25-28
Plant Maintenance & Engineering Show. Convention Hall, Philadelphia, Pa.

January 29
Akron Rubber Group. Sheraton Hotel, Akron, O.
Chicago Rubber Group. Furniture Club, Chicago, Ill.

February 1-5
American Society for Testing Materials. Committee Week. Hotel Sherman, Chicago, Ill.

February 2
The Los Angeles Rubber Group, Inc. Biltmore Hotel, Los Angeles, Calif.

February 3-5
Committee D-11, ASTM. Hotel Sherman, Chicago, Ill.

February 5-7
Boston Rubber Group. Ski Week-End. Bartlett Inn, Bartlett, N. H.

February 11
Fort Wayne Rubber & Plastics Group. Van Orman Hotel, Fort Wayne, Ind.

February 12-13
Southern Rubber Group. Shamrock Hilton, Houston, Tex.

February 19
Connecticut Rubber Group. Symposium: "Polymers for the '60's." Waverly Inn, Cheshire, Conn.

February 26
Quebec Rubber & Plastics Group. Ladies Night-Dance, Victoria Hall, Montreal, P.Q., Canada.

March 1
The Los Angeles Rubber Group, Inc. Biltmore Hotel, Los Angeles, Calif.

March 11
Chicago Rubber Group. Furniture Club, Chicago, Ill.

March 17
Quebec Rubber & Plastics Group. Queens Hotel, Montreal, P.Q., Canada.

March 18
Boston Rubber Group. Hotel Somerset, Boston, Mass.

March 21-23
American Physical Society. Detroit, Mich.

WASHINGTON REPORT

By JOHN F. KING

RMA Protests Proposed Wage Minimum for Federal Work

Rubber industry management has decided to make a fight over the government's move to peg minimum wages that must be paid employes working on federal orders for tires and related products.

Management's decision to oppose the imposition of a minimum prevailing wage rate under the Walsh-Healey Act by Labor Secretary James P. Mitchell contrasts with the AFL-CIO United Rubber Workers of America union's indifference toward the minimum wage issue. URWA has indicated that labor's chief weapon for securing equitable wage rates is and will remain collective bargaining. The union has said that while it welcomes the Labor Department's attempt to put a floor under tire and related product wage rates, it will continue to put its trust in face-to-face bargaining with management for the determination of wage rates, not government decree.

RMA Files Protest

Management's decision to oppose promulgation of a $1.67-$1.77 per hour minimum prevailing wage rate was taken December 4 when The Rubber Manufacturers Association, Inc., filed formal objections with the Labor Department. The objection followed an RMA strategy meeting November 24 here where members of the Association's manufacturing committee decided that the fight had to be made—not simply to block the minimum wage determination for tires and related products—but to put government and labor on notice that the industry cannot be pushed around in the future on labor matters.

The Labor Department earlier in the fall issued a tentative decision that any rubber company wishing to be eligible for government purchase contracts for "Tires and Related Products" had to pay its employes $1.77 per hour. If the employe was only a beginner, the minimum would be $1.67. Mitchell's decision, authorized under the 25-year-old Walsh-Healey Act, will not be finalized until the Department considers comments of interested parties. As already noted, only management will have any formal objections.

RMA Objections and Comments

The formal opposition of management reflects a number of considerations which were discussed in the November 24 RMA meeting on the subject.

Present were representatives of the bigger as well as smaller companies in the industry, along with the RMA counsel, G. D. Reilly, and Committee Chairman H. B. Lyda. It was the consensus of the RMA committee members that Mitchell's proposal would work a hardship on some of the smaller rubber companies, and, in some cases, even force companies to quit bidding on government contracts. Other reasons for which the group decided to fight the decision came up in the discussion later. These included:

- It was thought that failure to object to Mitchell's rule-making might be construed as an endorsement of both the Walsh-Healey Act and the manner in which it is administered by the Labor Department. Chief complaints on the last point were that the Department used inconsistent and conflicting formulas to arrive at the $1.67-1.77 minimum, that it demonstrated partisanship on behalf of labor against the companies, and that it failed to weigh the impact of the ruling on smaller firms in the industry.
- Failure to object, the group believed, might create an impression that the tire industry is an "easy target," or a "soft touch," for higher minimum wage determinations in the future.
- Further, the committee agreed, a vigorous objection to the whole proceeding would tend to discourage the establishment of minimum prevailing wage rates for other rubber products manufactured in other segments of the industry. The government buys scores of rubber products, in addition to tires and related products, and Walsh-Healey has not been made to apply on many of these.
- Strong objections from management, the group also thought, will delay the effective date of Mitchell's final order, possibly by several months, thus giving more time to many firms to prepare for the blow.
- Finally, the group thought it would turn to other agencies of government seeking their help in stopping the minimum-wage order from being finalized. Specifically, the Commerce Department and Small Business Administration, reportedly preparing to urge repeal of the Walsh-Healey Act, could make use of rubber industry wage data given to the Labor Department during the minimum wage hearings, the rubber group thought. These two agencies are supposed to be working closely with the U. S. Chamber of Commerce to do away with the minimum wage law.

Before his resignation recently, former Small Business Administrator Wendell B. Barnes lashed out at the Walsh-Healey Act, urging that it be erased from the books. Barnes claimed the minimum wage law frustrated the small business "set-asides" provided for in defense procurement. Many small firms, he said, could not pay the prevailing minimum in their industry and thus became ineligible to share in defense contracts.

U.S. Seeks Tax Relief For Malaya Investors

The Embassy of Malaya reported in December that the United States is seeking to negotiate a double taxation treaty with the rubber-rich Federation to prevent U. S. investors in the Asian republic from being taxed by both governments. The Embassy statement did not indicate how far along the treaty talks are, announcing only that negotiations are now under way.

If there is a successfully negotiated tax pact, it would mark the first to be signed by the Federation since it gained its independence. Currently, the Federation has a double taxation agreement with the United Kingdom signed before independence, but a new agreement which conforms with "changed

political conditions," according to the Embassy, is to be signed soon. It added that a number of European governments have expressed interest in entering into arrangements similar to the new U. K.-Malayan pact.

The Embassy statement noted that tax agreements are designed to spur an inflow of foreign investment. It said foreign investors have indicated that with double taxation agreements with the U. K., European, and U. S. Governments, "there would be greater incentive for capital investments."

GSA Announces 74,083 Tons Rubber Available for Sale in Future

The General Services Administration sold another 6,854 long tons of stockpiled rubber in November, with delivery from government warehouses scheduled through February, 1960, in accordance with the Independent Offices Appropriations Act of 1960 to sell stockpiled rubber, without replacement, to prevent deterioration.

GSA announced early in December a schedule of quantities and qualities of available rubber for sale from the stockpile as of November 30, 1959. The types and amounts covered by the schedule represent the rubber GSA will dispose of, but it is not stated that it will be sold during any given period of time. The amount of this schedule totals 74,083 long tons, but does not alter the agency's intention to sell only approximately 50,000 tons during the current fiscal year which ends on June 30, 1960. GSA will accept purchase orders for more than the 50,000 tons, however, between now and the end of the current fiscal year.

The following tonnages and types of rubber are available:

Grade	Long Tons
1X RSS*	32,253
1 RSS	9,003
2 RSS	628
3 RSS	777
4 RSS	346
5 RSS	34
1X Thin Crepe	3,790
1 Th. Cr.	11,008
2 Th. Cr.	1,414
3 Th. Cr.	203
1X Thick Crepe	1,130
1 Tk. Cr.	3,674
2 Tk. Cr.	353
Lib. Sel.	3,656
Lib. Reg.	1,528
1X Thin Brown*	219
2X Th. Br.*	625
3X Th. Br.*	13
1 Th. Br.*	205
2 Th. Br.*	916
3 Th. Br.*	22
4 Th. Br.*	34
2 Amber*	95
3 Amber*	1,304
4 Amber*	853
Total	74,083

GSA announced rubber sold from the stockpile, without replacement, from October 16, when the program began, to November 30 totaled 12,650 tons; therefore probably no more than between 35,000 and 40,000 tons will actually be sold by June 30, 1960. In the future, sales figures and quantities available for sale will be announced simultaneously on a monthly basis, shortly after the first of each month, GSA said.

Presumably this total of somewhat more than 35,000 tons to be sold by the end of the 1960 fiscal year will be made up largely of 35,000 tons of 1X RSS obtained from England in 1940 in exchange for cotton, which rubber GSA put on the market in mid-November at a 2c-a-pound discount.

In making public the disposal types and amounts of rubber it is willing to sell, GSA said that any company interested in buying from its "rotation schedule" could obtain copies of GSA Form 336, dated November, 1958, upon request. The form is entitled, "Special Terms for the Sale of Crude Natural Rubber," and contains terms and conditions covering the current sale and is available from GSA's Defense Materials Service, Washington 6, D. C.

The cumbersome procedures for disposing of stockpile rubber attracted critical attention from RMA President Ross R. Ormsby in November. He pointed out that the relatively small tonnage to be disposed of by June 30, 1960, will be sold under authority of the Independent Offices Appropriations Act. On the other hand, the bulk of the 470,000 tons held to be in excess of security needs will have to be sold in accord with Public Law 520, which requires publication of six months' notice in the Federal Register, and Congressional approval of the disposal plan. The six months' notice expires March 15, 1960, he added, and urged Congressional approval of a more workable disposal plan before that time to avoid further delay.

* The discounts offered for these grades in Supplement No. 3 to Schedule No. 6 remain in effect.

RMA-Special Committee Considers Food Additives Law Problems

A special committee of The Rubber Manufacturers Association, Inc., representing manufacturers of flat belt, hose, packings, O-rings, V-belts, sundries, and molded and extruded products met in New York, N. Y., December 9 to review and analyze Public Law 85-929, Food Additives Amendment to the Federal Food, Drug and Cosmetic Act and to measure its probable impact on manufacturers of products used in the production, processing, treating, packaging, and transportation of food. Harold H. Burrows, vice president, Raybestos-Manhattan, Inc., is the chairman of this special committee.

The Food Additives Amendment has been a subject for discussion at previous meetings of the RMA committees representing the manufacturers of the several products mentioned above since passage of the law in September, 1958. In addition, many companies have been conducting extensive tests over the past year in an effort to be ready for the deadline date of March 5, 1960, but have been unable to come up with suitable tests and test programs that are agreeable to the Food & Drug Administration.

Law Requirements

The FDA has indicated that after the deadline date, all rubber components or products which come in contact with foodstuffs must be made only from compounds it has approved. In order to obtain FDA approval, the manufacturer is required to submit the formulation of each compound to the federal agency, together with the results of a laboratory investigation conducted by a qualified independent testing organization.

The investigations must show to the satisfaction of FDA that either (a) no substance can be extracted from the rubber compound under test conditions simulating food service, or (b) the substance or substances extracted from the compound under test conditions must be identified and determined to be harmless to the health of man or beast.

The Food Additives Law applies to all rubber compounds in contact with food regardless of the fact that it could be shown in specific instances that a compound has been used for the purpose for 10 or 20 years without any known harmful effect.

One item the FDA is alarmed about is carbon black and the effects it might have if consumed after migrating from a rubber product used in contact with food. The FDA will not advise as to what testing procedures should be used, but is seeking recommendations from manufacturers who desire approval for their products.

Courses of Action

The entire rubber industry is gravely

concerned over the effect of this law on the marketing of its products. If each rubber products manufacturer attemped to have every food contact compound approved, hundreds and probably thousands of approvals would be involved; independent testing facilities would be overtaxed, and the very substantial cost of the invesigations could not be justified by many companies. It could mean that after March 6, 1960, the supply of rubber products to the food industry could be greatly restricted, and there might be some applications where no company had a suitable compound approved.

The RMA special committee is requesting all rubber products manufacturers to supply it with information listing the products they supply to the food industries; designating the color of such products; whether or not they contain carbon black; and the date of origin of said products.

The manufacturers are requested also to supply the special committee with lists of raw materials used in the manufacture of products sold to the food industries.

Following the receipt of all of this information the RMA special committee will decide upon its next course of action. Presumably, it hopes that some sort of compromise can be worked out with the FDA in order to avoid the expected chaos that will result in the rubber and food industries if the letter of the law of the Food Additives Amendment is enforced after March 6, 1960.

It was suggested that manufacturers having problems connected with this law direct their inquiries to Mr. Edward Welch, secretary, RMA Mechanical Rubber Goods Division, 444 Madison Ave., New York 22, N. Y.

INDUSTRY NEWS

RMA Sees 1959 Industry Records Exceeded in 1960

The rubber industry scored a number of new records in 1959, and Ross R. Ormsby, president of The Rubber Manufacturers Association, Inc., expects it to do better in 1960, according to the Association's year-end report.

New 1959 peaks, according to the RMA's preliminary estimates based on 10 months of actual record, include (previous records in parentheses):

Consumption of 1,615,000 long tons of new rubber (1,529,699 tons in 1955).

Consumption of more than 1,000,000 tons of synthetic rubber (925,879 tons in 1957).

Consumption of more than 1,000,000 tons of new rubber in tires and tire products (959,856 tons in 1955).

Consumption of nearly 600,000 tons of new rubber in non-tire products (569,843 tons in 1955).

Production of more than 1,300,000 tons of synthetic rubber (1,118,173 tons in 1957).

Shipments of more than 65,000,000 passenger-car replacement tires (61,603,596 in 1958).

Synthetic rubber exports of more than 280,000 tons (203,468 tons in 1957).

Activity Level High

Mr. Ormsby reported that extremely high levels of activity prevailed in every product segment of the industry. With 1947-49 as a base, the new rubber consumption index for tire and tire products jumped from 115.6 in 1958 to 136.7 in 1959, as against the previous high of 128.9 in 1955.

At the same time, an even sharper increase in activity took place in the field of non-tire products, which includes industrial rubber products, molded and extruded goods, belting and hose, packing, rubber footwear, flooring, sundries, heels and soles, and other items, where the new rubber consumption index advanced from 159.7 in 1958 to 189.3 in 1959, as compared with the 1955 peak of 180.7.

Mr. Ormsby said that the trend indicated by the consumption indices is expected to continue on the rising curve in 1960, with the index for the non-tire product groups continuing to run ahead of the Federal Reserve Board index of production, currently estimated at 149.0 in 1959.

He then pointed out how the use of 3.5-billion pounds of rubber in the production of 40,000 different types of consumer end-products made the industry an important market for manufacturers of textiles and chemicals. It was estimated that the rubber industry consumed more than a billion pounds of processing chemicals and nearly a billion pounds of textiles in the form of cotton, rayon, and nylon.

Raw Materials, Products

Although synthetic rubber accounts for 66% of the industry's basic raw material, the remaining 34% of natural rubber used in the United States represents a substantial tonnage and at today's prices a costly raw material. The price of No. 1 Ribbed Smoked Sheet rubber rose from about 30½¢ a pound in January, 1959, to a high of 47¢ a pound in the autumn and even in mid-December was in excess of 41¢ a pound; whereas competitive types of general-purpose synthetic rubber remained unchanged at 23¢ a pound, freight excluded, during this period.

In connection with the industry's raw materials supply problems, Mr. Ormsby took note of the fact that Congress will consider in the coming session an administration plan for disposing of some 470,000 long tons of natural rubber in the government stockpile which have been declared in excess of the nation's security needs. He said that the industry believes that an orderly and definitely stated plan for such disposal will not only effect an important saving to the taxpayer, but will be in the long-term interest of both the producers and consumers of natural rubber.

It was emphasized that while a tremendous amount of research and development had been applied during 1959 to the improvement in appearance and quality of its regular products, a great many new products had been introduced as a result of this R & D effort. Among these, to list but a few, were the first outer garment that will be worn by man in space; plastic film for flexible automobile tanks; a neutron shield for nuclear-powered ships and aircraft, made of pourable, rubber-based material; inflatable rubber pillows for use as dunnage in freight shipments; plastic and rubber boat shells; plastics so tough they can be precision engineered; and huge pillow-type fuel tanks for military and civilian use.

Statistics

The RMA gave the following figures of automotive and farm tire shipments for 1959 compared with 1958 and on rubber consumption by types for 1958, 1959, and 1960:

AUTOMOTIVE AND FARM TIRE EQUIPMENT

1958	Passenger	Truck	Farm	Total
Original equipment	23,434,743	3,375,039	1,709,106	28,518,888
Replacement	61,603,596	9,226,435	1,815,706	72,645,737
Export	720,105	630,903	109,984	1,460,992
Total	85,758,444	13,232,377	3,634,796	102,625,617
1959				
Original equipment	29,250,000	4,430,000	1,840,000	35,520,000
Replacement	65,500,000	9,860,000	1,960,000	77,320,000
Export	725,000	620,000	90,000	1,435,000
Total	95,475,000	14,910,000	3,890,000	114,275,000

UNITED STATES RUBBER CONSUMPTION

(Long Tons)

	1958	1959	1960
Synthetic rubber	879,912	1,060,000	1,094,000
Natural rubber	484,492	555,000	556,000
Total	1,364,404	1,615,000	1,650,000
Reclaimed rubber	248,156	290,000	295,000

Humphreys Anticipates New Records in 1960

Rubber industry sales are expected to amount to $6.2 billion in 1959 and to set a new high of approximately $6.6 billion in 1960, when the industry will produce tires at the rate of more than half-a-million on each of 250 working days, H. E. Humphreys Jr., chairman of United States Rubber Co., forecast in his year-end statement.

Sales of all types of tires in 1960 are expected to approximate 127 million units in 1960, as compared with about 118 million units in 1959. Of these, replacement passenger-tire sales should set a new mark of 68 million units in 1960, against the previous record of 65.5 million units in 1959.

Humphreys looks for a sharp gain in original-equipment tire sales in 1960 also because of 1960 new car production estimated at 6.6 million or higher, compared with the 5.5 million cars made in 1959. Higher automotive production will also spur sales of non-tire automotive products, he added, noting that the automotive industry buys approximately 12% of the rubber industry's output.

Truck and bus tire sales are expected to reach 15.2 million units in 1960, compared with 15 million in 1959. Of this 1960 total, approximately 9.6 million tires will be for replacement, and the balance for new trucks and buses and for export. Sales of farm, aircraft, and industrial tires are also expected to be at or near record levels.

Rubber consumption in the U. S. should set a new record of 1.62 million long tons in 1959 and increase to about 1.65 million in 1960.

U. S. Rubber will help set the industry pattern, with a new sales record of more than $950 million in 1959, and an even higher figure is expected in 1960, the U. S. Rubber board chairman said. Capital expenditures of approximately $32 million in 1960, contrasted with $25 million in 1959, are planned.

Evaluation of new materials for products the company manufactures will be in the forefront of an expanded research and developmnt program, with more than 1,000 types and variations of synthetic polymers evaluated as possible tire materials.

Among the important new products now in the process of commercial development are a single-filament polvethylene for ropes and many industrial products, thread and solid tires of polyurethane, it was said.

Keener Optimistic on 1960 Business Volume

Expanding markets both at home and abroad give the rubber and plastics industries cause for optimism on the physical volume of business during 1960, J. Ward Keener, president of The B. F. Goodrich Co., said in his year-end statement.

The continuing increase in the number of automobiles on the road means higher sales of replacement tires, and rising living standards point to further increases in world consumption of rubber and plastics.

He estimated that the U. S. would consume at least 1.6 million long tons of new rubber in 1959 and between 1.65 and 1.70 million tons in 1960. Demand for new rubber has been and still is growing faster in other Free World countries than in the U. S., with 1960 consumption in these Free World countries other than the U. S. estimated at 1.63 million tons.

The Goodrich president expects a new record of 127 million tires to be sold in 1960, of which 67.5 million will be replacement passenger-car tires for the more than 45 million cars which will be more than two years old in 1960. A substantial pickup in tire shipments for new cars and trucks in 1960 will aid this increase in tire shipments.

Growth in the use of rubber for non-tire products has been averaging about 5% a year, well above the growth trend in industrial production in this country, and the rubber consumption for these non-tire products in 1960 was estimated at an all-time high of 610,000 tons.

Keener pointed out that U. S. rubber consumption would have been higher in 1959 except for strikes against three major rubber companies in the second quarter and the effect of the steel strike on automotive production in the last half of the year.

Under the stimulus of higher natural rubber price, U. S. consumption of synthetic rubbers reached a record proportion of 65.5% in 1959 and should rise even higher in 1960.

B. F. Goodrich recently opened special-purpose synthetic rubber producing plants in Holland, Japan, and England, all in association with companies in these countries and announced plans for the construction of a vinyl resin plant in Australia.

Firestone Sees '60's Unusual Growth Period

Harvey S. Firestone, Jr., chairman and chief executive officer of the Firestone Tire & Rubber Co., predicted that the rubber industry will enter the "Soaring Sixties" in a strong, healthy condition and with a very bright future. In discussing in late December the outlook for the new decade he added that we are on the threshold of a 10-year period that promises unprecedented growth for the industry as it meets an ever-increasing demand for its products, and the year 1960 should be the greatest year in the history of our progressive industry.

It was explained that this optimistic forecast was based on the great promise existing in the general economy, the rapidly increasing number of motor vehicles in use, the rapid growth of foreign markets, the improved technology within the rubber industry, the expansion of existing production facilities, and diversification into broadened fields of activity.

The bright outlook for the general economy was based on a new high for the gross national product in 1960 that will be 7% higher than in 1959, and a full 50% above the 1950 figure, and the fact that disposable income, the money people have left after taxes, will also be up by 7% in 1960, another record high.

It was emphasized by the Firestone executive that the automotive industry promised almost phenomenal growth in the 1960's, and that this would have a vital influence on the rubber industry.

European countries, now in a boom, are experiencing a strong trend toward more vehicles in use also, and the

resultant increase in tire consumption will also be paralleled by great increase in the growth of the synthetic rubber industry in foreign countries. Many American rubber companies have operational or manufacturing interests in these foreign growth industries.

The technology of the industry is presently at a very high level and is progressing rapidly, Mr. Firestone said. We are almost daily confronted with new combinations of our available raw materials as we meet varying demands in rubber products, and these special uses will contribute to our continuing growth, he added.

A record consumption of rubber on a worldwide basis of 4.2 million long tons, a further increase in rubber consumption in the United States, an increase in U. S. total tire demand to 127 million units, passenger-car tire replacement shipments of between 68 and 70 million units, and an overall increase in the demand for non-tire products, were predicted for 1960.

It was also predicted that synthetic rubber usage on a worldwide basis will equal and then surpass the use of natural rubber in the 1960's until, eventually, synthetic rubber will take over two-thirds of the market for all kinds of rubber.

The Firestone company will not only carry out extensive expansion plans in the Sixties, but will increase its programs in other rubber-like materials, textiles, metals, and chemicals, the chairman said.

O'Neil Predicts 1960 Record Sales Volume

William O'Neil, president of The General Tire & Rubber Co., forecast that the rubber industry will record its greatest sales volume in 1960, even greater than it registered in the record year of 1959. He cited the growing population and its rising demand for all products, an increase in capital expenditures to provide for the growing demand, a greater number of jobs, and the necessity of maintaining a program of research, development, and production of the things vital to the security of world peace as the factors for good business in 1960.

He indicated the need of caution, however, pending settlement of the steel strike, which had affected 1959 fourth-quarter results and might do likewise in the first quarter of 1960. If the steel industry negotiations with labor result in an anti-inflationary decision at the bargaining table, the nation's economy will come bouncing back strongly thereafter, he added.

The forecast of increased demands for automobiles and trucks in 1960 means that General's plastics, chemicals, and mechanical rubber goods divisions in addition to its tire factories will be kept busy. Because of the uncertainty in the crude natural rubber market and because of the uncertainty of tire prices, General's profit picture, like that of all other major manufacturers, is a question mark, it was said. The price of natural rubber is of relatively greater importance to General Tire because of its predominant position in the truck tire field and because its percentage of consumption of natural rubber is higher than the industry pattern.

The General Tire president predicted that 1960 will bring the greatest demand ever for premium and extra-quality tires and added that facilities are being increased to meet this demand.

Even with the forecast for increased sales, 1960 was viewed as a year where selling will be vital to a company's success regardless of product line, and General Tire is planning the biggest advertising and sales promotion campaign in its history in order to meet its forecasts.

NRB Reports Plans To Aid Natural Output

H. C. Bugbee, president of the Natural Rubber Bureau, emphasized that sales of natural rubber continue heavy in the world and the United States in his year-end report. Figures on natural rubber production and consumption, as listed below, show that significant amounts of rubber have had to come from stocks in 1958 and 1959 to supply world demand, and this situation is expected to continue in 1960. In 1959, both the United States and Great Britain announced the beginning of disposal of their natural rubber stockpiles so that the deficit in that year was alleviated somewhat from this source.

WORLD NATURAL RUBBER SUPPLY-DEMAND, 1958-1960

(In 1,000 Long Tons)

Year	Supply	Demand	Deficit
1958	1,957	1,982.5	25.5
1959*	2,010	2,080.0	70.0
1960*	2,050	2,085.0	35.0

*Estimated.

In the United States, natural rubber consumption rose from 484,492 tons in 1958 to 555,000 tons in 1959 and is expected to reach 560,000 tons in 1960.

Reference was made to the heavy replanting and new planting program in Malaya where by the end of 1959 well over one-third of that country's 3,500,000 acres will have been planted with rubber yielding 1,500 to 2,000 pounds per acre, as compared with the average yield of 490 pounds per acre. It is thus that the shortages of the future may be at least partially eliminated, and this program is evidence of the natural rubber industry's confidence in the future, it was said.

Malayan rubber growers are spending $3.5 million on research and development each year to improve further their position. As a part of this activity, a technical service will be inaugurated in the United States in 1960 so that American consumers will have available promptly the many advances developed in natural rubber laboratories all over the world. A similar technical service has proved successful in England and other countries abroad.

By 1960, world consumption of natural and synthetic rubber is estimated at some 3,780,000 tons, and by 1965, some rubber industry economists have forecast consumption at 4,500,000 tons. By replanting so as to produce more rubber and more cheaply and by researching to make rubber more useful in more ways, natural rubber growers are looking forward to contributing to a rapidly growing rubber economy, it was stated.

Scrap Rubber Outlook May Improve in '60

Ben Gordon, A. Schulman, Inc., and president of the National Association of Waste Material Dealers Scrap Rubber & Plastics Institute, in the 1960 edition of the NAWMD's "Commodity Review and Outlook," said that as the year 1959 ended, there was very little encouraging news that could be reported which would lead to any obvious improvement in the consumption of scrap rubber and its price structure. The situation was considerably upset by the long steel strike which caused curtailment of production in a great many unrelated industries.

Mixed tires have required scheduling, and with the supply of such material available in nearby points, mill demand can be met without too much difficulty at present price levels, it was said. If demand increases to any extent, and material from distant points with higher freight rates is shipped, then higher prices will have to be paid by reclaimers.

The demand for truck tires and butyl tubes seems to have increased since mid-year, and prices were generally higher. Truck tires of wire cord or wire tread construction have caused rejections as they cannot be used by the reclaimer.

The slight changes made in recently published reclaimers' specifications for scrap rubber have not greatly altered the previous specifications and should cause no inconvenience, said Gordon.

Very little scrap rubber has been shipped out of the country, and recently the only item sought by foreign countries has been No. 1 peelings, which are not being produced in quantity because of curtailment of splitting operations. Should the demand for split parts be increased, some difficulty might result in supplying the demand.

Ready markets are available for

clean, uncontaminated grades of scrap plastics, but contaminated lots make the sorting cost prohibitive.

If the predictions of a banner year in automotive and related industries hold true, the volume and use of scrap rubber and plastics in 1960 should be considerably higher than in 1959, although not too great change in price levels of most items is anticipated.

Seeks FPA Funds

Cyril F. O'Neil, vice president in charge of foreign operations, The General Tire & Rubber Co., Akron, O., has accepted a key post in the $1-million fund-raising campaign of the Foreign Policy Association, New York, N. Y., for 1959-60, according to John W. Nason, Association president. O'Neil, who is also a member of the board of directors of the Association, will head the appeal for funds within the rubber industry.

The campaign seeks increased support for the Association's expanding nationwide program to help create a better informed citizenry on the basic world affairs issues confronting us—described by President Eisenhower as the country's "number one problem" today. This program, based on community participation, now includes thousands of groups of citizens in hundreds of communities in 45 states, and the number of participants has doubled each year for the past five years.

C. A. Bartle Retires

Carl A. Bartle, a long-time sales executive at E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., and a widely known figure in the nation's rubber industry, has retired from the company after a career with it of almost 37 years.

In September, 1918, he joined Du Pont as a chemist and later that year was made a production supervisor at the company's Repauno plant at Gibbstown, N. J. He left the following year to become chemical supervisor of production for National Aniline & Chemical Corp., Marcus Hook, Pa. He returned to Du Pont in 1923 and was assigned to sales in the New York office of what was then the dyestuffs department.

"Cabby" Bartle was transferred in 1925 to the Chicago district sales office. In 1929 he was appointed assistant sales manager for rubber chemicals at Wilmington, Del., became sales manager of the rubber chemicals division (now the elastomer chemicals department) in 1932, and sales director in 1943. He continued to head up the sales of rubber chemicals until a year ago, when he was named a special assistant pending his retirement.

Willard Stewart, Inc.

Carl A. Bartle

Mr. Bartle was born November 13, 1894, in Philadelphia, Pa. He received his Bachelor of Science degree in electrochemical engineering from the Pennsylvania State College in 1916, then joined the Aluminum Co. of America as a research engineer.

A past chairman of the New York Rubber Group, he is also a member of the Buffalo, Boston, Chicago, and Philadelphia Rubber groups, and the Rubber Division of the ACS.

Spiratube Conducts Hot Air at Spartan

The problem of drying paint quickly at different points on the production site was solved by Spartan Aircraft Co., Tulsa, Okla., with the installation of flexible duct work on an assembly line of mobile homes.

The inside of a mobile home made by Spartan is painted after assembly. The paint is dried by means of hot air pumped into the interior of the trailer through a portable connector at the door. Since the sizes of the mobile homes vary, the door openings are not always at the same spot in the drying room. This condition suggested a movable rather than a rigid duct work for the supply of hot air from an overhead blower.

The flexible duct work selected was Spiratube® a patented construction of spring wire and coated fabric, manufactured by Flexible Tubing Corp., Guilford, Conn.

The base fabric used is cotton, with a specially developed neoprene coating applied at the Vulcan plant of Reeves Brothers, Inc., Buena Vista, Va. The coated fabric is sewn in overlapping plies over continuous helical coils of high-carbon spring steel.

Length of the duct work used by Spartan is 22 feet; inner diameter of duct is 16 inches. Pumping pressure is one inch water column. Because of abrasion when duct work is dragged over the floor, scuff strips are fitted to a 10-foot section at the discharge end.

At times, the same system is used to carry exhaust fumes out of the interior of the trailers.

New Dayton-Hevea Firm

A new company to sell automotive and industrial rubber products in Europe's Common Market has been formed by The Dayton Rubber Co., Dayton, O., and N. V. Vereenigde Nederlandsche Rubberfabrieken (known popularly as "Hevea"). The announcement was made recently in Dayton and in Arnhem, Netherlands, headquarters for the overseas sales company which will be known as Dayton-Hevea. The details were arranged through Dayton Rubber International.

Hevea has been licensed to make the American firm's products for sale in the Common Market. The products will carry the Dayton-Hevea label. These include raw-edge automotive V-belts, cog belts, and Vari-speed V-belts, flexible radiator and vacuum hose, printing and industrial rollers, foam latex, and polyether foam.

This is the first time Dayton Rubber has entered into a licensing agreement for foreign manufacture of any of its patented proprietary products. Hevea will profit by the expansion of its product line and the addition of many exclusive Dayton products® which have strong acceptance in Common Market countries. For Dayton Rubber, the new company and agreement represent a marked broadening of the international technical assistance program which the company has conducted since 1934. Dayton has supplied technical assistance and production know-how, under contract, to the wholly Dutch-owned and operated company since 1948.

BFG Gets Tire Patent

The B. F. Goodrich Co., Akron, O., has been granted a patent on diaphragms, or safety chambers, for use in automobile tires, ending a 10-year legal battle. The invention covers a molded rubber and fabric diaphragm, which can be inserted into tubeless tires to provide a second air chamber for added safety if air should escape from the tire. Marginal flaps, seated between the tire and the rim, lock the unit securely in place. The inventor is Clarence E. Snyder, a Goodrich tire engineer, who has since retired. The application for patent was filed March 16, 1949. Production of the tires will be started by BFG early in 1960.

Bill O'Neil Observes 50 Years in Rubber

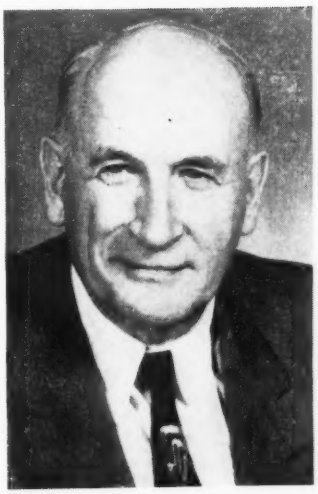
William O'Neil, president of The General Tire & Rubber Co., recently observed 50 years in the rubber industry. This dynamic figure first worked in the merchandising department of his father's department store in Akron, but was not happy in this work. He became interested in the tire business and during a trip West on doctor's orders conceived the idea of selling tires in Kansas City. It was here that he started in the rubber business with Win Fouse, an auditor from the Firestone Tire & Rubber Co., with a distributorship for Firestone tires.

In a special issue of the *Akron Beacon Journal* on October 28, businessmen and industrialists in Akron and throughout the country paid special tribute to Mr. O'Neil and the very great contributions he and his company have made to the rubber industry.

Young O'Neil had the urge to go into tire manufacturing so that in 1915 the O'Neil-Fouse combination sold out their half-million-dollar tire distributorship and returned to Akron. General Tire was incorporated for $200,000 in 1915, with Michael O'Neil, Mr. O'Neil's brother, as president, and William O'Neil as executive vice president. Other key executives were Chas. J. Jahant, in charge of the production department, Robert Iredell as chief engineer, and Harold B. Pushee as chief chemist.

Production was started early in 1916 and from the beginning the policy of quality products and a distributor organization were basic at General Tire.

The company under Mr. O'Neil's guidance has branched out and prospered in many fields. Subsidiaries Aerojet-General and RKO General are leaders in the fields of missiles and entertainment, respectively. General's plastics and chemical business are a big part of the company's activities, and synthetic rubber (SBR) production and sale are a recent addition. The company is also a majority stockholder in A. M. Byers Co., of Pittsburgh, Pa., a top wrought-iron producer.



William O'Neil

Office Building at 3M Research Site

Minnesota Mining & Mfg. Co.'s new 14-story office building is the latest step in development of the 3M research center east of St. Paul, Minn., started 10 years ago.

Based on the important place of product research in the firm's postwar growth, the company resolved before 1950 to create a research center with room to grow. A 215-acre area east of St. Paul was purchased, and early in 1953 plans were announced for the first building on the tract.

Planning was broadened to include an administrative center when it was realized that expansion possibilities at the present headquarters at 900 Bush Ave., St. Paul, could not keep up with the company's growing needs.

Today, seven buildings with a total of 560,000 square feet have been completed. Additions and two new buildings are under construction that will add another 205,000 square feet in 1960. The new office and cafeteria buildings will add another 520,000 square feet in 1962.

Additional land has been purchased to a total of 265 acres. Development is following a plan that envisions laboratories, pilot plants, services and office buildings spaced over the entire tract, following the natural land contour and using landscaped grounds, curving streets and walks, and parking areas to achieve a campus effect.

Some of the completed buildings include the central research laboratories, electrical products laboratories, nuclear research laboratory, hydrogenation laboratory, utilities center, pilot plant, and graphic products laboratory.

Some buildings under construction are the office services center, pilot plant and maintenance center, electrical products laboratory addition, central research laboratories addition, and the utilities center addition.

30-Year Club of RTA Holds Yule Dinner

The Thirty-Year Club of the Rubber Trade Association held its fifth annual Christmas dinner on December 8 at the Downtown Athletic Club, New York, N. Y. The members each brought a guest who was a protege, member of the family, or a friend. Eighty were present at the sirloin-steak dinner.

The Club was organized seven years ago and now has 48 members. All of the members are directly concerned with selling or using natural rubber. Many of the members have been in the business the past 50 years. Besides four social functions a year the Club does an excellent job in remembering the sick by sending books, flowers, or other gifts.

Since the organization of the Club, S. J. Pike has been chairman, and the following three members comprise the steering committee: Cyrus Dunachie, R. A. Favenza, and Hugo Hauff. Arthur J. Garry is secretary-treasurer of the organization.

The Yuletide dinner of the Rubber Trade Thirty-Year Club

Hooker Officers Move

Hooker Chemical Corp., Niagara Falls, N. Y., has announced that nine company officers and certain other corporate personnel will move to the company's new corporate headquarters at 666 Fifth Ave., New York, N. Y., about March 1. The offices are expected to be open about that date.

Officers who will be transferred include: Thomas E. Moffitt, president; R. Wolcott Hooker, Frank W. Dennis, and Robert E. Wilkin, senior vice presidents; Ansley Wilcox, II, vice president, secretary, and general counsel; Thomas F. Willers, vice president, responsible for the Eastern Chemical, phosphorus, and Durez Plastics divisions, and for corporate engineering; F. Leonard Bryant, vice president, responsible for research, marketing, and general development; Charles C. Hornbostel, controller; and Edward W. Mathias, treasurer.

Other executives moving are: Roger C. Sonnemann, director of industrial relations; William F. Lynch, administrative assistant to Mr. Dennis; Herman Harrow, personnel assistant; and Douglas M. More, associate counsel.

In addition to the corporate group, the New York district sales offices of the Eastern Chemical, Durez Plastics, and phosphorus divisions will move to the new location from the Lincoln Building, 60 E. 42nd St.

The New York office organization is expected to be augmented to a limited extent in March or later on as required.

New Uses of Terra-Tire

A broad new field has been opened to commercial vehicle manufacturers because of the unusual characteristics of the Terra-Tire which was developed by The Goodyear Tire & Rubber Co., Akron, O., about five years ago. This development was a signal for producers of industrial and commercial vehicles to design special equipment which previously was impracticable because of the disadvantages of conventional tires in various applications.

This five-year period has brought about the design and manufacture of some unusual vehicles, ranging from missile-carriers and marsh buggies to tree-knockers. Also included in the list of Terra-Tire-equipped vehicles are farm tractors, scrapers, graders, golf carts, mining equipment carriers, logging tractors, and many others.

The principle which enables these vehicles to travel over rough or swampy terrain lies in the tire design. When a conventional tire is unable to provide adequate mobility, it is because the pressure the tires exert on the ground is too great for the ground to support it. Terra-Tires allow this situation to be reversed. The strength of the ground is determined; then the proper tire is selected to carry a given load at one pound per square inch less than the ground strength.

Farmers find these vehicles invaluable in performing several tasks. These include harvesting rice in fields where even vehicles equipped with tracks bogged down. The Millburn Peat Co., Otterbein, Ind., uses Terra-Tires on a Caterpillar scraper to mine peat. The United Fruit Co. uses the tires on its farms in Panama to haul bananas over irregular terrain, without bruising the fruit. The tires also have been used effectively in grading the Santa Anita race track, in cleaning bathing beaches, and on mobile golf carts.

Satterthwaite Retires

A. L. Satterthwaite, manager of the control division, elastomer chemicals department, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., elected to retire from Du Pont at the end of December after a 37-year career.

Satterthwaite joined the company in 1923 and was assigned to the organic chemicals department's technical laboratory, Deepwater Point, N. J. Three years later he was transferred to the export sales division as a technical correspondent. In 1930 he was named manager of the production control section of the control division, becoming manager of that division in 1945. He was appointed manager of the planning division in 1953, a position he held until early 1957 when he was transferred to the newly formed elastomer chemicals department and appointed manager of its control division.

Born December 3, 1899, in Stanton, Del., Satterthwaite received his Bachelor of Science degree in chemistry from Cornell University in 1922. In August of that year he began work with the Newton Falls Paper Co., Newton Falls, N. Y., as a chemist. He joined Du Pont the following spring.

Bulk Material Trailer

Delta Tank Mfg. Co., Baton Rouge, La., is producing a new pressurized highway trailer originally designed to haul bulk dry cement which can also cut shipping costs for bulk users of nearly 50 other pulverized materials. These materials are used by such industries as the food, construction, metals, chemical, plastic, paint, rubber, petroleum, fertilizer, petrochemical, and others.

The new trailers, outwardly resembling large petroleum tank-truck transports, are filled at production or bulk distribution centers through weatherproof top openings. These trailers then can be driven right into plant yards where their pulverized contents are discharged in aerated streams through four-inch flexible hoses at rates ranging up to 200 barrels per hour or faster. Pneumatic unloading speed varies with the specific weight of the materials.

Capacity of the highway transports is limited only by highway weight restrictions established by states in which units are used. Effective discharge range for dry cement delivery is approximately 150 feet in any direction. Some of the materials which can be transported include bentonite, calcium carbonate, carbon black, diatomaceous earth, magnesium oxide, clays, synthetic resins, and zinc oxide.

The new highway transports are marketed nationally by Trailmobile, Inc.

BFG Rubber Conveyor

Longest single flight of rubber belting ever engineered into a conveyor system is now at work at Ada, Okla., delivering 1,000 tons of crushed limestone and shale an hour—capacity equal to 20 loaded 50-ton railroad cars.

The belt, manufactured by B. F. Goodrich Industrial Products Co., Akron, O., forms a 12,000-foot section of what is said to be the world's longest permanent overland transport belt conveyor system. The belt is so long that it makes only 10 round trips in an eight-hour day, even though it moves forward constantly at 500 feet per minute.

A total of 11 miles of BFG rubber belting comprises a system which conveys raw materials from a quarry to the new cement plant erected by Ideal Cement Co. When the system is fully loaded and running, the belts keep a 1,000-ton load in motion, spanning two highways and two railroad lines en route over a 5½-mile course.

The belts are said to realize savings through reduction of maintenance, labor, and equipment costs both in the original installation and operation of conveyor systems. Long-length belts reduce the number of motors needed since each separate belt requires its own drive plus a transfer structure. Service life, too, is improved in long-length belts since loads on longer belts are deposited less frequently on the same spot on the belt.

This new belt is reinforced with four plies of "Nyfil" fabric, a combination of super-strength rayon with nylon filler which permits belt operating tensions up to 200 pounds per inch of width per ply. A special, thick, abrasion-resistant synthetic rubber cover protects the belts against impact, cutting, and gouging. A portable electric vulcanizer was used to perform 45 splices which made the belts endless on the drive.

B. F. Goodrich Industrial Products designed and manufactured the conveyor belting to conform to the requirements of the conveyor system which was furnished by Link-Belt Co., Chicago, Ill., prime contractor.

New Hetrofoam Radomes

Designed to meet a growing need of ground shelters providing greater dielectric transparency to minimize energy loss and boresight error in radar tracking installations, the world's first polyurethane foam radome has been erected at Ottawa, Ont., Canada, by the Dominion's National Research Council.

The radome, including joints, is constructed entirely of foam. With an equatorial diameter of 26.5 feet, the structure consists of 115 premolded rigid Hetrofoam (TM) panels in nine different geometric shapes and sizes molded by Long Sault Woodcraft, Ltd., St. Andrews East, P.Q., Canada.

To facilitate erection and to help hold the panels in place, temporary U-shaped pin fasteners were hammered into predrilled holes. Following this mechanical erection, the panels were "welded" into a continuous foam structure by using additional polyurethane foam as joint mortar, and at the same time the temporary locking pins were removed. This radome is the direct outgrowth of a development program sponsored jointly by the Royal Canadian Air Force and the National Research Council.

In terms of size, the radome is slightly less than three-fourths of a sphere of 26.5-foot internal equatorial diameter and rests on a 22-foot diameter bolt circle. Panel thickness is 3½-inches, with dimensional tolerances set at ±1/16-inch. Based on NRC calculations, the radome is capable of withstanding wind velocities of 200-300 miles per hour.

NRC-design requirements called for the use of a fire-resistant polyurethane foam, a requisite which the fabricator met by using Hetrofoam 10 resin, a product of Hooker Chemical Corp., Niagara Falls, N. Y.

Within weeks the radome will be dismantled and transferred to another site for an extensive program of electronic testing utilizing actual field radar equipment. From these electrical analyses NRC expects to obtain data indicating the suitability of such foam for radar at the frequencies involved.

NRC's polyurethane foam radome

Firestone Producing Small Race Car Tires

Miniature race tires featuring all the safety and high-speed characteristics of full-size professional race tires now are in production for quarter midget race cars and go-carts, according to H. S. Richard, director of racing, The Firestone Tire & Rubber Co., Akron, O. The tremendous growth of these two forms of racing in the last three years and their increased speeds have created a need of improved tires.

Firestone's miniature tires are especially built tires featuring nylon cord and race-tire construction. These five- and six-inch tires are patterned after Firestone's midget race tires used by professional drivers.

The new quarter midget, go-cart tires will be available in five sizes, with a racing slick tread design. Three sizes, 4.50-6, 4.00-6, and 3.50-6 are designed for rear wheels; while the 3.00-5 and 3.50-5 sizes are for front wheels. These tires will also be available in a grooved tread design in 3.50-6 and in a power tread design for use on dirt tracks in 3.50-5 and 3.50-6 sizes.

Today there are more than 60 quarter midget race tracks in California and some 300 in the United States. On week-ends families in cars and trucks can be seen hauling the little machines and their young drivers for a day at the races.

Go-cart racing or "Karting" is the adult version of quarter midget racing. These tiny, gasoline-powered buggies consist of little more than a skeletal frame, 40 to 50 inches long, a 2½ horsepower, one cylinder motor, a seat, and four wheels. The carts weigh up to 80 pounds and reach speeds between 30 and 50 miles per hour.

Go-cart racing appeals to the adult in that its prime goal is speed. Quarter midget racing, on the other hand, has a limited horsepower and an age limit between four and fourteen.

K. D. Smith Retires

After 35 years with the rubber industry, K. D. Smith has retired from active employment with National-Standard Co., Niles, Mich. He was vice president of rubber and automotive relations, but will continue to serve in an advisory capacity.

During his career, Mr. Smith was employed by the Miller Rubber Co., Syracuse Rubber Co., The Firestone Tire & Rubber Co., The B. F. Goodrich Co., and National-Standard Co. With the latter company 15 years, he was headquartered in its Akron, O., office.

K. D. Smith

As a pioneer in rubber chemistry, he became well known as a tire construction engineer and wrote a number of papers on tire materials. He was instrumental in the development of low-pressure tires. During World War II, he served in the U. S. Army Ordnance Department assigned to the development of synthetic tires.

Gates' Low-Profile Nylon Cord Tire

Gates Rubber Co., Denver, Colo., has announced a new low-profile nylon cord tire which is said to wear 25% longer than conventional tires. The new tire, called the 1960 Air-Float DeLuxe, gives such wear for two reasons. First, the lower, wider shape of this tire reduces sidewall flexing and slippage, resulting in less heat build-up. Because of the design, more rubber is on the road, which is said to give more mileage, enabling the tire to roll more freely with less road friction. Secondly, these new tires are made of 100% cold rubber tread, which research at Gates helped develop into the longest wearing rubber compound.

The longer mileage possible with the new tire is a bonus for motorists since the Air-Float DeLuxe carries no added premium price compared to other nylon tires of comparable construction. The guarantee with the tire has no time or mileage limit and covers failure from any cause.

Gates, now completing a $15-million plant in Nashville, Tenn., recently opened a $500,000 manufacturing plant in Toluca, Mexico. The company pioneered in the manufacture of nylon tires, in the use of cold rubber, and in high-capacity construction methods that increase tire resistance to impact damage, it is further claimed.

NEWS BRIEFS

AMERICAN CYANAMID CO., organic chemicals division, Bound Brook, N. J., has announced that newly designed and installed equipment for the production of MBTS (benzothiazyl disulfide) is living up to expectations and producing a product with excellent dispersibility as well as high purity and light color. The new MBTS is the result of almost two years of basic research programs and is designed to provide the user with improved dispersion where it is a critical factor or to speed up mixing where dispersion is not so critical a factor. It is expected to be particularly useful in wire insulation and in thin-walled extrusions or molded products where poor dispersion of the accelerator often results in holes or other flaws that might cause rejection of the product. In the manufacture of items from natural, SBR, and NBR rubbers the new MBTS is expected to provide greater efficiency and economy.

HOBBS MFG. CO., Worcester, Mass., has announced that its 44-inch Hobbs Vers-A-Wind machine, designed for the take-up of extruded plastic and rubber film, is undergoing severe testing at Davis-Standard, division of Franklin Research Corp., Mystic, Conn. The D-S technicians are using the machine for reeling up test batches of extruded plastic blown-film or sheet produced by its new Model 25T Thermatic® thermoplastic extruder. The wide latitude of adjustments and broad range of the Vers-A-Wind enable the technicians to adjust the take-up quickly and accurately for each test batch. The Hobbs Vers-A-Wind and Davis-Standard extruder are offered as a packaged assembly to customers.

BATTELLE MEMORIAL INSTITUTE, Columbus, O., is now prepared to accept a larger number of requests from industry for the irradiation of specimens that will be used in research studies conducted by individual companies. The power level of the Battelle research nuclear reactor, in operation more than three years, was doubled earlier this year, raising its normal operating level to two million watts. This power doubling and Battelle's experience in handling irradiation studies are the main factors behind the decision to broaden the assistance which the research center now can offer.

PHILLIPS CHEMICAL CO., Bartlesville, Okla., will increase production of its new "Cis-4" polybutadiene rubber to a rate of 20,000 long tons a year. Necessary enlargement of the Borger, Tex., synthetic rubber plant will be completed by August, 1960. Butadiene to make "Cis-4" is supplied by the parent company's adjacent butadiene plant.

COLUMBIA-SOUTHERN CHEMICAL CORP., Pittsburgh, Pa., has announced the organization of a wholly owned subsidiary to be known as the Columbia Cement Corp. The new corporation will own and operate the cement plant formerly owned and operated by Columbia-Southern Chemical Corp. at Zanesville, O. It will also market the cement produced at Columbia-Southern's new cement installation at Barberton, O. The board of directors of the new firm consists of E. T. Asplundh, chairman, David G. Hill, J. A. Neubauer, C. F. Bingham, J. E. Burrell, and J. T. Owens. The officers are: J. A. Neubauer, president, W. K. Farst, vice president-operations; W. B. Sippey, vice president-sales; L. S. Williams, controller; E. H. Eaton, treasurer; and J. T. Owens, secretary.

TUMB-L-MATIC, INC., Stamford, Conn., manufacturer of tumbling equipment and compounds, has appointed two new sales representatives. Thomson & Willett Co., Haverford, Pa., has been assigned the eastern Pennsylvania, southern New Jersey, Delaware, and Maryland territory. Joseph Upton, Jr., New York, N. Y., will cover metropolitan New York, northern New Jersey, and the Hudson Valley section as far north as Schenectady. By September, 1960, Tumb-L-Matic's schedule calls for additional representation to provide national sales coverage.

THE PANTASOTE CO., ELEONORA DIVISION, Passaic, N. J., has announced an expansion program which will increase its poly(vinyl chloride) resin capacity by more than 300%. Installation of 12 new poly(vinyl chloride) resin kettles will give the firm a total capacity of 45 million pounds annually. The enlargement is slated for completion by the first half of 1960.

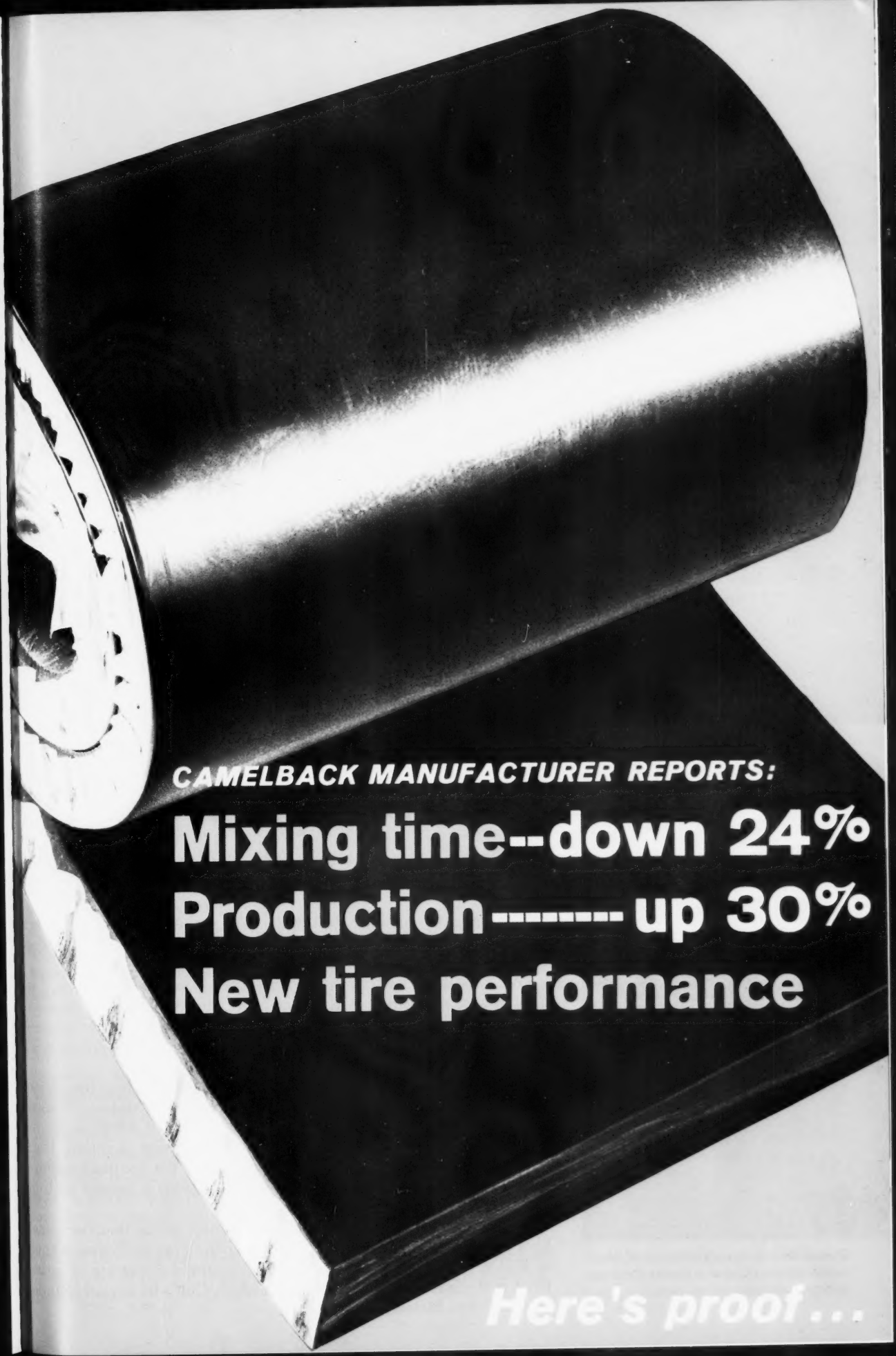
THE FIRESTONE TIRE & RUBBER CO., Akron, O., has announced plans for introduction of a Firestone premium-quality tire to be made of butyl rubber. The new tire, to be priced at the premium level, provides excellent soft ride qualities and extreme cornering quietness, Raymond C. Firestone, president, reported. The new tire is said to have premium tread depth and a tread design which makes maximum use of butyl, a synthetic rubber, providing added mileage and extra traction efficiency on wet road surfaces.

OHIO RUBBER CO. has completed an expansion program that will more than double the tire warehouse facilities of its Conneautville, Pa., plant. Utilizing the most modern concept of warehouse design, the new facility will enable the firm to expand vastly its inventory of finished agricultural, semi-pneumatic, and juvenile tires. Along with this warehouse expansion, shipping dock facilities were extended to accommodate a greater volume of business efficiently and quickly.

HARRY A. BAUMSTARK & CO., St. Louis, Mo., has been appointed a sales representative by the United Ultramarine & Chemical Co., Inc., New York, N. Y., according to William F. Siemon, Jr., vice president. The territory of the new representative includes eastern Missouri, northern Arkansas, southern Illinois including Peoria, and southeastern Iowa including Burlington and Fort Madison. The complete line of Ultramarine pigments will be represented, including reds, violets, greens, and blues.

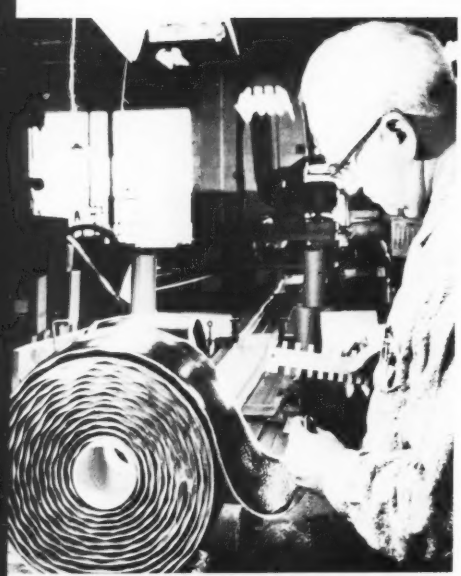
STAUFFER CHEMICAL CO., New York, N. Y., has acquired General Foam Products, Los Angeles, Calif., a firm which manufactures a range of expanded polystyrene under the brand name of Crest-Foam and which will be operated as a unit of Stauffer Chemical's molded products division. Officers of General Foam are: Charles A. Lindsay, president; John Stauffer, vice president; Joseph J. Burris, secretary; and Frederick N. Cartan, manager. Crest-Foam comes in both self-extinguishing and regular grades, in expanded bead, billet, board, and special shapes.

R. B. HUBER ASSOCIATES, a recently formed company, has its office at 216 Tremont St., Boston, Mass. George C. Sheldon has joined the company, which functions as manufacturers' representatives serving customers in the paint, rubber, and chemical field in the sale of industrial raw materials. Sheldon was formerly sales manager for the coating and adhesives department of The Borden Chemical Co. and prior to that had served in the same capacity at General Latex & Chemical and UBS Chemical.


CAMELBACK MANUFACTURER REPORTS:
Mixing time--down 24%
Production-------up 30%
New tire performance
Here's proof...

PROCESSOR SAVES...

with Goodrich-Gulf



Edward Malone, General Manager of Washington Rubber Company, checks the gauge uniformity of extruded camelback.

"MIXING TIME REDUCED 24%"
—Washington Rubber Company

Processing costs go down fast when you use Ameripol Micro-Black masterbatch. Listen to Edward L. Malone, General Manager, Washington Rubber Company, Washington, Pennsylvania:

"As a result of switching to Micro-Black," says Mr. Malone, "we have been able to reduce mixing time 24%. Because there is no excessive heat buildup in the masterbatch, the addition of scorch retarders is unnecessary. By eliminating one mixing cycle, we can produce as much as 30% more camelback stock a day."

Washington Rubber finds another processing advantage in the greater tensile strength of Micro-Black masterbatch. Says Mr. Malone, "Tensile strength of milled rubber is 3600 psi compared with 3200 psi for the rubber previously used—indicating superior dispersion of carbon black—and a constant Mooney viscosity is obtained. We get more uniform rubber gauge at the extruder and production volume is greater with far less reject material."

Customer reaction is excellent. "Retread shops tell us that our camelback made with Ameripol Micro-Black is giving wear performance equal to that of new tires. This is the result of improved dispersion of carbon black in the latex, possible only with Goodrich-Gulf's jet stream agitation process," Mr. Malone states.

RECAPPER SELLS...

Micro-Black Masterbatch

"NEW TIRE MILEAGE AT ONE-THIRD THE COST"
—Anchor Tire Company

Retreads with the life of new tires are being produced by Anchor Tire Company, Pittsburgh, with Washington Rubber camelback.

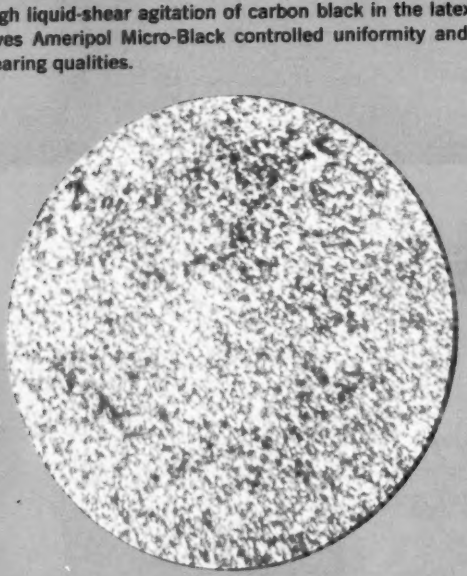
Says John Behan, owner of Anchor Tire, "Our customers are consistently averaging 40,000 to 50,000 miles with retreaded tires on the drive wheels of truck tractors, and between 70,000 and 100,000 miles on trailer tires."

Anchor credits the unusually high abrasion resistance of tread rubber compounded with Ameripol Micro-Black for this longer service life. "Despite the beating truck tires take today," says Mr. Behan, "turnpike driving, heavier loading, modern traffic with its sudden stops—tires retreaded with camelback made from Micro-Black rubber are lasting just as long as new tires and at only one-third the cost."

According to one of Anchor Tire's customers, a truck rental agency, this extra mileage pays off. The manager states, "To operate efficiently, recaps have to give us a minimum of 30,000 miles service. If they don't —back they go to the supplier for a rebate based on the difference between 30,000 and the actual mileage. Figuring the cost per mile of an average truck tire at $.00065 a mile, doubling tread life is like getting a new tire free."

Anchor Tire Company produces retreads that last as long as new tires, with camelback processed with Ameripol Micro-Black.

High liquid-shear agitation of carbon black in the latex slurry gives Ameripol Micro-Black controlled uniformity and better wearing qualities.



HERE'S WHY

Ameripol Micro-Black gives savings like these...

Goodrich-Gulf's exclusive process—high liquid-shear agitation of latex and carbon black slurry—results in thorough dispersion of black throughout the latex. You get controlled uniformity of masterbatch.

You cut your processing costs. There's no messy, expensive carbon black cleanup or storage. The carbon black's already in the masterbatch, so you eliminate one complete weighing and milling operation. Warehousing and handling are also simplified.

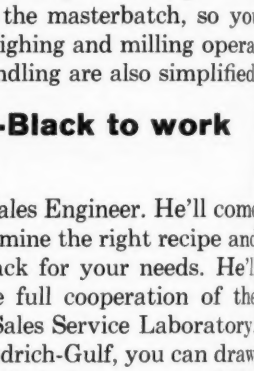
How to put Micro-Black to work in your operation

Call your Goodrich-Gulf Sales Engineer. He'll come to your plant to help determine the right recipe and proper grade of Micro-Black for your needs. He'll help you test it, with the full cooperation of the Goodrich-Gulf Technical Sales Service Laboratory.

When you deal with Goodrich-Gulf, you can draw on the production and technical resources of the leader in the field. We offer the largest synthetic rubber capacity in the world, and the most advanced laboratory service in the industry. Call on us today.

FREE

New illustrated data book gives full information on *Ameripol Micro-Black* . . . its properties and applications. Send coupon for your free copy.



GOODRICH-GULF CHEMICALS, INC.
1717 East Ninth Street, Cleveland 14, Ohio

☐ Send free Micro-Black Data Book.
☐ Send test samples of Micro-Black. Our use is for

Name_____

Title_____

Address_____

City_____ Zone____ State_____

Goodrich-Gulf Chemicals, Inc

1717 East Ninth Street, Cleveland 14, Ohio

PENNSALT CHEMICALS CORP., Philadelphia, Pa., is investing about $500,000 in a new blending, packaging, and warehousing plant at Atlanta, Ga. Scheduled to go on stream in the Spring of 1960, the new plant will be the seventh unit devoted to production of Pennsalt specialties added in the past five years. This plant will be constructed on a 10-acre site served by a direct rail spur and express highway, permitting fast service to area customers. A modern one-story structure, the plant will provide production and warehousing facilities for Pennsalt's brand-name chemical products used by dairies, food processors, commercial laundries, aviation, metal processors, refrigeration, air conditioning, and aerosol packagers.

GOODRICH-GULF CHEMICALS, INC., has moved its general office from 3121 Euclid Ave., Cleveland, O., to 1717 E. Ninth St., East Ohio Building, Cleveland 14, O. The new telephone number is TOwer 1-3500.

ROGER WILLIAMS TECHNICAL & ECONOMIC SERVICES, INC., Princeton, N. J., a chemical market research organization, has acquired the British consulting firm of George Lewi & Partners, London, England. Terrence O'Keeffe, executive partner of Lewi, has been appointed vice president and European manager of the Williams corporation. Since 1951, Williams has conducted economic surveys, both domestically and abroad, for many chemical, rubber, and petroleum companies and for government agencies. This addition to the company enables it to offer its clients the same approach to European market appraisals that it has provided in the United States.

THE WARE CHEMICAL CORP., Westport, Conn., has appointed Chemicals & Pigments Corp., 227 California St., Newton 58, Mass., its agent in New England for its line of predispersed chemicals sold under the trade name Prespersions. These items will be handled by Donald Lukens and William E. Walker.

MOBAY CHEMICAL CO., Pittsburgh, Pa., plans a third major expansion of its isocyanate facilities, scheduled for completion in July, 1960. The expansion will raise Mobay's annual capacity to more than 25 million pounds for tolylene diisocyanate (TDI), one of the principal chemicals used in the manufacture of urethane foams, solid elastomers, and protective coatings. Mobay's second expansion, raising its TDI capacity from 12 million to 18 million pounds, is now nearing completion at its New Martinsville, W. Va., plant location and is expected to be in operation within 60 days.

TYREX, INC., New York, N. Y., reveals that more than 120 tire dealers or their employes have won $11,000 in merchandise prizes since the start of its $45,000 "Tiger Bonanza" contest. Nearly 10,000 contestants so far have entered the nation-wide competition. Enthusiasm for the promotion has spread rapidly among tire dealerships, resulting in unusual interest and a high rate of recall of the weekly messages about Tyrex viscose tire cord, which is the basis of the contest. Contestants received in advance of each week's competition direct-mail pieces containing specific information about Tyrex viscose tire cord. To win a prize, the contestant, when called on the telephone, had to answer a question about the information contained in the direct-mail piece. The grand prize winners will be announced this month, reports Tyrex.

J. O. ROSS ENGINEERING DIVISION, Midland-Ross Corp., was host to customers and suppliers November 6 in its new office building at 320 S. School St. in Webers Industrial Park Area, Mt. Prospect, Ill. The 12,500-square-foot building affords three times as much space as the former office in the Chicago Loop, and the site provides space for future building expansion. Headed by Vice President L. G. Janett, the office serves the territory bounded by Canada, the Gulf of Mexico, the Rocky Mountains, and the Middle Eastern States. Ross Engineering has been a leader in the development, design, and fabrication of equipment for controlled atmospheres in processing plants since its founding in 1921.

DAYTON INDUSTRIAL PRODUCTS CO., a division of The Dayton Rubber Co., recently opened a modern 20,000 square-foot warehouse and regional office building featuring "same-day" service in Cincinnati, O. Ground was broken at the same time for a 13,000 square-foot warehouse addition next to the new modern brick and concrete structure. The company's line of multiple and fractional horsepower V-belts and sheaves, industrial hoses, friction and plastic electric tapes, automotive V-belts, radiator hoses, and car mats will be distributed from the new facility. More than 500 jobbers and other customers will be served from the warehouse, responsible for product distribution in Ohio, most of Indiana, Michigan, western Kentucky, western Virginia, and western Pennsylvania.

FIFE MFG. CO., Oklahoma City, Okla., a leading manufacturer of automatic web guiding equipment, is erecting a new 7,500-square-foot addition to its present plant. This addition will be occupied by Fife's expanding research and development department.

MONSANTO CHEMICAL CO. plans to move its rubber chemicals development section to Akron, O. Transfer of the development section from its present location at Nitro, W. Va., will be completed early in 1960 with the relocation of Philip E. McIntyre, rubber chemicals development section manager, to Monsanto's Akron offices. The move will enable the section to monitor new rubber chemical needs through close contact with customer companies.

THE GOODYEAR TIRE & RUBBER CO.'s flooring sales department, Akron, O., has announced that production of all types of flooring, counter toppings, and wall coverings will be devoted exclusively to vinyl materials. As of December 31, the company has discontinued production of all of its rubber flooring lines. Vinyl products represent the fastest growing portion of the flooring industry, it was reported. All research and development, production, sales promotion, and advertising will be put behind the company's vinyl flooring and counter top materials. Coinciding with the announcement is the completion of a multi-million dollar expansion revealed June 1, which doubles production capacity of the firm's vinyl flooring products.

DEARBORN RUBBER CORP., a leading distributor of mechanical rubber goods to midwestern industry, has completed its move to new office-warehouse quarters at 2545 S. 25th Ave., Broadview, near Chicago, Ill. The company was formed in August, 1954, as successor to the Chicago branch of Shields Rubber Co., by F. J. Comfort and two partners, now deceased, J. V. Lanahan and J. W. Caspar. It is the distributor for several national firms, including the mechanical goods division of United States Rubber Co. Products handled include all types of industrial hose, conveyor and elevator belting, power transmission products, packings, expansion joints, and mats and matting.

BORDEN CHEMICAL CO. has been cited by the Leominster, Mass., Industrial Development Commission for "vital social and economic contributions to the community in promoting its continued growth and prosperity." The citation highlighted the second annual "Salute to Industry" banquet sponsored by the Leominster Chamber of Commerce. The award was accepted by William Holloway, superintendent of Borden's polyvinyl chloride plant, from Judge Richard Comerford, chairman of the commission. Holloway accepted the plaque not only in behalf of the polyvinyl chloride department, but also for its Polyco-Monomer department, which operates a polyvinyl alcohol plant in Leominster.

NEWS about PEOPLE

P. M. Bullock

Fred Meendsen has been named technical sales representative for industrial chemicals for Velsicol Chemical Corp., Chicago, Ill. With headquarters at Memphis, Tenn., he will cover Tennessee, Arkansas, Mississippi, Louisiana, and Alabama. He has been with the company for three years, handling special staff assignments.

Arthur Thomas, Jr., is now commodity sales manager of Kralastic materials for the Naugatuck Chemical Division of United States Rubber Co., Naugatuck, Conn. **John M. Bolt** succeeds Thomas as manager of the division's Memphis, Tenn., district sales office. Thomas will plan all sales activities for Kralastic, a blend of rubber and plastic. Bolt will supervise sales of the Division's products in Alabama, Arkansas, Kansas, Kentucky, Louisiana, Missouri, Oklahoma, Tennessee, and Texas.

Ewell E. Mitchell has been appointed plant manager of the Goodrich-Gulf Chemicals, Inc., plant at Institute, W. Va. He was formerly production manager of the Goodrich-Gulf plant at Port Neches, Tex.

Bruce W. Barnes and **L. F. McBride** have joined Columbian Carbon Co., New York, N. Y., as sales representatives for the carbon black and pigment division. Barnes will serve the Mid-Atlantic States from the Camden, N. J., office. He was formerly branch sales manager for Berkshire Chemicals, Inc. McBride, who will be located in Akron, O., will serve sections of Ohio, Pennsylvania, and West Virginia. He was previously general purchasing agent with Landers Corp.

B. W. Barnes

L. F. McBride

F. Meendsen

M. Richardson

Maurice W. Richardson, Jr., has been appointed sales engineer for Farrel-Birmingham Co., Inc. He will headquarter at the company's Akron, O., office. His previous experience in the rubber industry includes four years with The B. F. Goodrich Co., Akron.

Thomas B. Hill, Jr., is now vice president and general sales manager of Burlington Industrial Fabrics Co., New York, N. Y. He was formerly a sales vice president. **John A. Cissel, Jr.,** previously a salesman, becomes sales manager of the newly created mechanical and coated products department which will handle sales to the rubber industry and coating trades.

O. V. Tracy, newly elected president of Esso Standard Oil Co., New York, N. Y., has been named a member of the board of directors of the Newark College of Engineering Research Foundation, according to **Robert W. Van Houten,** president of the Foundation and the College. The Foundation, established last March, operates to help the professional development of faculty members, to draw young engineers into teaching profession, and to assist secondary school teachers of science and mathematics.

George B. Koch, Jr., has been appointed advertising manager of industrial and commercial products for The B. F. Goodrich Co., Akron, O. The position was recently created to centralize the administration of all national advertising for B. F. Goodrich and its nine divisions. Koch had been advertising manager responsible for divisional public relations, sales promotion, and technical literature.

Page M. Bullock has been named carbon black technical salesman with Godfrey L. Cabot, Inc., Boston, Mass. Mr. Bullock will assist D. B. Doherty on Midwest sales from the office at Akron, O. Since joining Cabot in 1956, Bullock has been representing the minerals and chemicals division in the Akron area, but will now devote all of his time to carbon black sales in this same area. He was formerly associated with E. I. du Pont de Nemours & Co., Inc., as a salesman and with Merck & Co., Inc., as assistant to the general sales manager and later as sales representative in northern New York State for Merck's industrial chemicals division.

Ralph W. Shrum has joined Genruco Processing Co., Nashville, Tenn., as chief chemist. Genruco is an operating division of Genesco, a large manufacturer of men's, women's and children's shoes. Shrum was formerly technical director of Cat's Paw-Holtite Rubber Co., Baltimore, Md.

R. B. Robitaille moves to Milan, Italy, as managing director of Phillips Carbon Black Italiano; while **C. M. Wilson** succeeds him as manager of Phillips Chemical Co.'s eastern district rubber chemicals sales at Providence, R. I. Phillips Carbon Black Italiano, jointly owned by Phillips Petroleum Co. and ANIC, S.p.A., will build a plant at Milan having an initial design capacity of 25 million pounds per year of oil blacks. Robitaille, who started with Phillips in 1944, has been eastern district representative since 1952. Wilson, since 1956 technical sales representative, rubber chemicals sales division, in Akron, O., joined the company in 1948.

R. B. Robitaille

C. M. Wilson

W. E. Anderson

B. F. Watkins

Walter E. Anderson has been named sales engineer of Scott Testers, Inc., Providence, R. I. He will be responsible for sales of Scott testers throughout the continental United States.

Roger S. Firestone, president of Firestone Plastics Co., Pottstown, Pa., and a director of The Firestone Tire & Rubber Co., Akron, O., has been elected president of United Cerebral Palsy's Research & Educational Foundation, and vice chairman of the board of directors of United Cerebral Palsy Associations. Firestone, who has served three terms as president, one as executive vice president, and as national campaign chairman, received a recognition award for his service to the organization.

John W. Brownley has joined Industrial Rayon Corp., Cleveland, O., as staff assistant to **Frederick L. Bissinger,** vice president and general manager. Previously Brownley was executive vice president of Industrias Consolidadas de Matanzas, a major rayon producer in Cuba.

Clyde E. Schetter has been promoted to the post of western public relations manager of The Goodyear Tire & Rubber Co., Akron, O. He will supervise the public relations activities from his headquarters in Los Angeles, Calif. His former position was assistant manager of public relations.

H. S. Pritchard has been named vice president, new developments, of Dunlop Canada, Ltd., Toronto, Ont., Canada. He brings to this position 32 years' experience in the manufacture and marketing of Dunlop products. In his new capacity he will be responsible for the development of new products, both for manufacture and resale distribution, under the company's diversification program.

Robert J. Barrus has been named advertising manager for Jefferson Chemical Co., Inc., Houston, Tex. He formerly was with the advertising department of Union Carbide Plastics Corp., division of Union Carbide Corp.

J. H. Morrison, H. J. Bennett, and **B. F. Watkins** have joined the field sales staff of The Goodyear Tire & Rubber Co.'s chemical division, Akron, O. Morrison succeeds **R. B. Williams,** who recently became district manager, as sales representative for the division's West Coast district. He was formerly chief chemist with another rubber firm. Bennett has been named sales engineer in the rubber and rubber chemicals department and will be concerned primarily with sales service of Plioflex, Goodyear's synthetic rubber. Watkins, who is now field sales trainee, will work with sales service aspects of all the division's products, preparatory to a field assignment.

J. H. Morrison

H. J. Bennett

Fredrick J. Bueche has joined the University of Akron staff as research associate in the Institute for Rubber Research and professor of polymer physics. Dr. Bueche was formerly professor of physics at the University of Wyoming.

J. L. Whitney has been named sales-service engineer for the Marbon Chemical Division, Borg-Warner Corp., Washington, W. Va. He was formerly with the technical department of the B. F. Goodrich Koroseal division.

S. C. Trager has been appointed manager of the distribution department of Pure Carbonic Co., a division of Air Reduction Co., Inc., New York, N. Y., according to **J. J. Lincoln, Jr.,** president. Recently Trager has served as assistant to the vice president, distribution, in the New York headquarters.

S. C. Trager

H. B. Puff

J. C. Cameron

G. J. Jones

J. Craig Cameron has been appointed manager of technical services for the B. F. Goodrich Footwear & Flooring Co., Watertown, Mass.; while **George J. Jones** succeeds him as technical superintendent of footwear. Jones previously held the position of technical superintendent of process.

R. W. Van Tuyle, vice president of manufacturing, research, and development, has announced a reorganization of the development and service department of Emery Industries, Inc., Cincinnati, O. Three major sections have been established within the department: an applications section, a product development section, and a technical service section. These groups will all report to **Walter T. Meinert,** who resumes the position of director of development and service. **John D. Farr** has been appointed manager of the product development section. The technical service section will be staffed at present by **Robert H. Dhonau,** who will coordinate all technical service activities for fatty acids, and Mr. Farr, who will coordinate the balance of the company's organic chemicals. **Robert D. Aylesworth** remains manager of the applications research section.

Paul G. Carpenter has been assigned the position of executive vice president and general manager of Copolymer Rubber & Chemical Corp., Baton Rouge, La. Dr. Carpenter has been acting general manager for the past year.

Henry B. Puff has been made manager, field sales, of the Durez Plastics Division, Hooker Chemical Corp., North Tonawanda, N. Y. **Richard W. More** succeeds Puff as assistant product manager, resins. **Ross S. Tanner** fills the newly created position of division controller. Puff has been with Durez since 1946. More was recently in sales engineering with the company. Tanner was previously chief accountant of the division.

Francis P. Iapalucci has been named plant manager of Lake Erie Machinery Corp., Buffalo, N. Y. He has broad experience in line and staff work in engineering, manufacturing, and sales.

News about People

O. V. Tracy has been elected to succeed **William Naden** as president of Esso Standard Oil Co., New York, N. Y. **Robert H. Scholl** succeeds **E. Duer Reeves** as executive vice president. Tracy has been a director (since 1954) and a vice president (since 1956) of Standard Oil. Scholl has been a vice president and a director since 1954. Naden, who was president of Esso since August 1958, is now executive vice president and a director of the new Humble Oil & Refining Co., organized September 4 to consolidate the exploration, producing, refining, marketing, and marine operations of United States affiliates of Standard Oil Co. (N. J.). Reeves is now vice president and director of the Humble company.

Thomas S. Moroney, Thomas H. Reilly, and **Ted A. Venia** have been appointed sales representatives for the silicone products department, General Electric Co., Waterford, N. Y. Moroney will cover the Cleveland, O., district (Michigan Territory) and will headquarter in Detroit, Mich. He has several years' experience in industrial sales and product development work. Reilly will represent the New England district, from the Boston, Mass., office. He recently served as a marketing research and product planning specialist for G-E silicone products. Venia, who will operate out of Bridgeport, Conn., will represent the eastern district. Previously he served as representative for the department's western district.

Douglas G. Rodenburg has been named to head technical service on rubber chemicals for Naugatuck Chemicals, Division of Dominion Rubber Co., Ltd., Montreal, P.Q., Canada. From his headquarters at the company's office in Elmira, Ont., he will assist customers in solving rubber compounding problems.

Charles W. Carroll has been named Akron district sales manager for American Synthetic Rubber Corp., Louisville, Ky. Carroll, who has been with the company since last May, will headquarter at the Akron, O., district office.

C. W. Carroll R. W. Munson

F. L. Bryant T. F. Willers

Thomas F. Willers, vice president of Hooker Chemical Corp., Niagara Falls, N. Y., will be responsible for the Eastern Chemical, phosphorus, and Durez Plastics divisions, as well as for corporate engineering. **F. Leonard Bryant,** vice president, has been assigned responsibility for corporate research, marketing, and general development. **John S. Coey,** vice president, succeeds Willers as general manager of the Eastern Chemical Division. Also, **James W. Ferguson** has been named sales manager of the Durez Plastics Division to fill the vacancy created by the recent death of **Alfred W. Hanmer. Robert E. Noble** succeeds Bryant as general manager, phosphorus division, and **Charles Y. Cain** succeeds Coey as sales manager, Eastern Chemical Division.

J. S. Coey J. W. Ferguson

Frederick N. Cartan has joined Stauffer Chemical Co. as department manager, general foam products. He will headquarter at the Molded Products Division office in Los Angeles, Calif.

Robert W. Munson has been appointed assistant eastern district sales manager for The New Jersey Zinc Co., New York, N. Y. He will supervise the company's pigment sales activities in the southern area of the eastern district. He has been with the company since 1947.

Daniel D. Downes has been appointed sales manager of the distilled fatty acids division of Capital City Products Co., Columbus, O. He was previously assistant sales manager and succeeds the late **E. G. Hibarger.**

A. J. Head is now manager of Phillips Chemical Co., a wholly owned subsidiary of Phillips Petroleum Co., Bartlesville, Okla. His former position was that of manager of the manufacturing divisions of Phillips Chemical Co.

Joseph A. Milner has been appointed purchasing agent and controller of traffic of Cary Chemicals, Inc., East Brunswick and Flemington, N. J., producer of PVC resins and PVC-VA compounds. Previously he had been with both Ansonia Wire & Cable Co. and Holyoke Wire & Cable Co., in charge of purchasing and material control.

Charles W. Haines has been named assistant to the chairman of New York Rubber Corp., Beacon, N. Y. He recently was New York and New England district manager for *National Petroleum News,* a McGraw-Hill publication.

Seymour Milstein and **Harry C. Hachmeister,** president and executive vice president, respectively, of The Ruberoid Co.'s Mastic Tile Division, have been elected to the Ruberoid board of directors. **Oscar A. Maggia** has been elected secretary of the company and will continue as assistant treasurer. **Herbert Abraham** has been named honorary chairman of the board. He served previously as chairman of the board and as president of Ruberoid, New York, N. Y.

Charles D. York has been made staff superintendent of B. F. Goodrich Tire Co., a division of The B. F. Goodrich Co., Akron, O. He was formerly manager of accounting at the company's Tuscaloosa, Ala., plant.

L. G. Turk has been appointed sales manager of the rubber machinery division of National Rubber Machinery Co., Akron, O. He was previously operating manager of the company's plastic machinery division. **W. G. Potts** becomes assistant manager, extruder sales division. He has 14 years' experience with the company in plastics engineering and sales.

L. G. Turk W. G. Potts

G. R. Lawson

M. M. Bump

Albert H. Clem will fill the newly created office of vice president of marketing for Pennsalt Chemicals Corp., Philadelphia, Pa. In his new position Clem will coordinate all the marketing activities of the company. He recently held the post of general sales manager of both industrial chemicals division and the chemical specialties division. **George R. Lawson** succeeds him as general manager of the chemical specialties division. Lawson was formerly director of marketing for the industrial chemicals division.

David R. Hammel and **Frederick T. Philips** have been appointed to key positions in the plastics divison of Enjay Co., Inc., New York, N. Y. Hammel becomes technical coordinator, in which capacity he will coordinate technical service and technical sales for plastics. Philips, as manufacturing coordinator, will coordinate production and shipments between affiliates' plants and Enjay.

C. F. Stroud has been named sales manager of the tire division of The Goodyear Tire & Rubber Co., Akron, O. Formerly eastern trade sales manager, he will now be responsible for trade sales in the company's six regions. **R. W. Fitzgerald,** former western trade sales manager, plans to retire on April 1. In the meantime he will serve as assistant to Vice President O. E. Miles.

Edward R. Bartley now fills the new post of manager of marketing research with the B. F. Goodrich Co., Akron, O. He will be responsible for the expanded research effort on Goodrich's future marketing programs. He has been with the company for six years as a statistician in the business research department.

Vincent Schoeck has joined the Chicago, Ill., office of J. P. Stevens & Co., Inc. He will act in a sales and technical service capacity to cover the coating, mechanical rubber goods, plastics, soft goods fabrication, and other industries in Illinois, Minnesota, Wisconsin, Indiana, Michigan, Ohio, and Colorado.

Morrison M. Bump has been elected executive vice president of United Carbon Co., Inc., New York, N. Y., according to **R. W. French,** president of United Carbon Co., the parent company. In his new position, Bump will direct all marketing activities, technical service, distribution, public relations, and advertising of the subsidiary, while he continues to serve as director of marketing for the parent firm.

Rodney M. Vining, Philip A. Lamb, and **Eugene N. Sidoroff** have received new appointments in the Polyfibron (polymers-fibers) division of Dewey & Almy Chemical Division, W. R. Grace & Co., Cambridge, Mass. Vining becomes general manager of The Vellumoid Co., Worcester, Mass., a subsidiary of W. R. Grace and operated by Dewey & Almy. He was formerly Dewey & Almy treasurer and controller. **Thomas G. O'Neil** continues as Vellumoid sales manager. Lamb, general manager of Dewey & Almy's Endura products plant, Quakertown, Pa., also assumes new responsibilities for sales of "Darex" shoe products. Sidoroff, Endura sales manager, becomes sales manager for Darex shoe products as well. Sales headquarters for the shoe products will be moved to Quakertown.

E. H. Brozey has been appointed manager of mileage sales for B. F. Goodrich Tire Co., division of The B. F. Goodrich Co., Akron, O. Previously he held the position of manager of dealer promotion for the tire company.

Mrs. Marie J. McCarthy, for more than 32 years circulation manager of RUBBER WORLD, retired on December 31.

John C. Haughey has been named manager, Midwest sales for National Polychemicals, Inc., Wilmington, Mass. **Norman W. Torgersen** becomes New England area representative. In addition, **John C. Blackwood,** who joined the company early this year, has been appointed manager, eastern sales, and **Francis X. O'Keefe,** who had been administrative assistant, is now sales coordinator.

Martin F. Wilkerson becomes sales manager, chlorinated products division, for Diamond Alkali Co., Cleveland, O. **Robert L. Walker** replaces Wilkerson as branch manager of the company's southwest district sales office. Wilkerson has 11 years' sales experience with the company. Walker for several years has been a salesman for the southwest district sales office.

Joseph E. Thornberg fills the newly created position of manager, market research, in the sales department of the Eastern Chemical Division, Hooker Chemical Corp., Niagara Falls, N. Y. Thornberg has been in Hooker's sales department for the past six years, most recently as market analyst.

Harold W. Ritchey and **Joseph C Jorczak,** vice presidents, have been added to the board of directors of Thiokol Chemical Corp., Trenton, N. J.

OBITUARIES

George R. Lyon

George Richard Lyon, manager of foreign synthetic rubber projects for The Goodyear Tire & Rubber Co., Akron, O., died November 30 at an Akron hospital, after prolonged illness.

Mr. Lyon was with Goodyear for 30 years, beginning with the chemical engineering staff, as foreman, and later in the research department. In 1942 he became manager of the synthetic plant at Port Neches, Tex. From 1944 to 1950 he worked with the Rubber Reserve Corp., government-owned, Goodyear-operated Akron synthetic plant as plant manager, assistant production manager, and finally as production manager. From 1950 to 1958 he was production manager of all Goodyear's synthetic operation. Last February he became manager of foreign synthetic rubber projects for the company.

He was a member of the American Chemical Society and the American Institute of Chemical Engineers.

The deceased was born December 28, 1900, in Ridgeville, O. He received his bachelor's degree in chemical engineering from Ohio State University in 1923.

He is survived by three sons, a daughter, eight grandchildren, a brother, and a sister.

Funeral services were held December 3 at the First Methodist Church, Cuyahoga Falls, O., and burial took place the same day at Rose Hill Burial Park, Cuyahoga Falls.

Obituaries

William S. Rea

William S. Rea, sales consultant for United Carbon Co., New York, N. Y., died suddenly November 25, at San Bruno, Calif.

He had been associated with Chicago Color Co., West Coast Calcimine Co., and Binney & Smith Co., before he joined United Carbon Co. in 1929. He rose to the position of eastern district manager with United Carbon. Later, he became a sales consultant for the company and for health reasons moved from New York to California.

Mr. Rea was born October 3, 1893, in San Francisco. He received his degree in science from the University of California in 1916. Then he entered the Navy and was commissioned a first lieutenant.

He is survived by his wife, three sons, and eleven grandchildren.

George F. Weaton

George F. Weaton, retired manager of the Josephtown, Monaca, Pa., plant of St. Joseph Lead Co., died December 4 in his home near Monaca.

His career began with General Electric Co.; he later worked for J. & P. Coates Co. in the field of steam generation and electric power production. Next he was chief engineer with Thomas A. Edison Co.

He joined St. Joseph Lead Co. in 1921 and was in charge of the power generation and distribution facilities in southeast Missouri. In 1926 he was appointed engineering consultant at the Herculaneum, Mo., smelter to a pilot stage project for developing an electrothermic zinc smelting procedure. This led to his appointment as manager of the project in 1928. Under his leadership in 1930 the first commercial electrothermic zinc smelter was built in the United States at Josephtown, initially producing zinc oxide and sulfuric acid. Again, under his leadership the first successful vacuum condenser for condensing zinc fume to zinc metal was developed with the Josephtown plant.

In 1957-1958 he supervised the design and installation of a 100,000 KVA power plant for the Josephtown operations. It is named the George F. Weaton Station in his honor.

He was a member (associate) in the Rubber Division of the American Chemical Society and of its 25-Year Club, of the Akron Rubber Group, and the American Institute of Mining, Metallurgical & Petroleum Engineers.

Mr. Weaton was born July 12, 1886, at Cherry Valley, N. Y.

He is survived by his wife, three sons, three daughters, twelve grandchildren, and two great grandchildren.

Funeral services were held December 7 at Trinity Episcopal Church, Beaver, Pa. Interment was private.

Pach Bros., N. Y.

Ludwig C. Boos

Ludwig C. Boos

Ludwig Charles Boos, vice president of United States Rubber Co., New York, N. Y., and general manager of its international division, died December 7 of a heart attack while visiting his daughter in Cos Cob, Conn.

Mr. Boos began his career in the rubber industry in 1923 as an apprentice in one of the tire plants of United States Rubber Co. In 1926 he became tire sales assistant in the export company and two years later was sent as special representative to Puerto Rico and later to Central America.

He served subsequently as branch manager in Puerto Rico and Cuba and in 1939 was appointed managing supervisor of all the company's Caribbean activities. Two years later he became head of United States Rubber Export Co., Ltd., and continued in that position until 1952, when the export company was dissolved. The deceased was then made vice president and general manager of the newly formed international division.

Mr. Boos was president and director of United States Rubber International Corp., United States Rubber Co., Ltd., Cuba; United States Rubber Mexicana S.A., Mexico, and United States Rubber Internacional de Venezuela. He was also director of United States Rubber International (Great Britain), Ltd., London, England; The North British Rubber Co., Ltd., Edinburgh, Scotland; United States Rubber International, Brussels, Belgium; The Rubber Regenerating Co., Ltd., Manchester, England; Lastex Yarn & Lactron Thread (Overseas) Ltd., London; Société Europeenne de Fils Elastiques, Paris, France; Pirelli Lastex Societa Italo Americana Filo Elastico S.p.A., Milan, Italy; The National Foreign Trade Council; Rubber Export Association; Inter-American Safety Council Inc.; and The International Road Federation.

Mr. Boos was also a member of the Metropolitan Club, the Greenwich Country Club, and the Country Club of Havana, Cuba.

He was born May 11, 1903, in Trinidad, B.W.I. He was educated in the United States at Montclair Academy and St. Johns Manlius.

Mr. Boos is survived by his wife, a daughter, two grandchildren, a brother and a sister.

A Solemn High Requiem Mass was sung December 10 in St. Mary's Roman Catholic Church in Greenwich, Conn.

J. Albert Scellen

James Albert Scellen died suddenly November 22 at his home in Fullerton, Calif.

After having received his education at the University of Michigan, he entered the rubber industry as a chemist for Dominion Rubber Co., Ltd. He was technical representative for Pequanoc Rubber Co., Butler, N. J., for 16 years. After Pequanoc's plant was destroyed by fire he served as a chemist for Kirkhill Rubber Co., Brea, Calif.

Mr. Scellen was a member of the American Chemical Society, Rubber Division, and the New York, Chicago, and Detroit Rubber groups.

The deceased was born in Kitchener, Ont., Canada, 55 years ago.

He is survived by his wife, two sons, three grandchildren, a brother, and a sister.

Interment was at Mount Rest Cemetery, Butler, N. J.

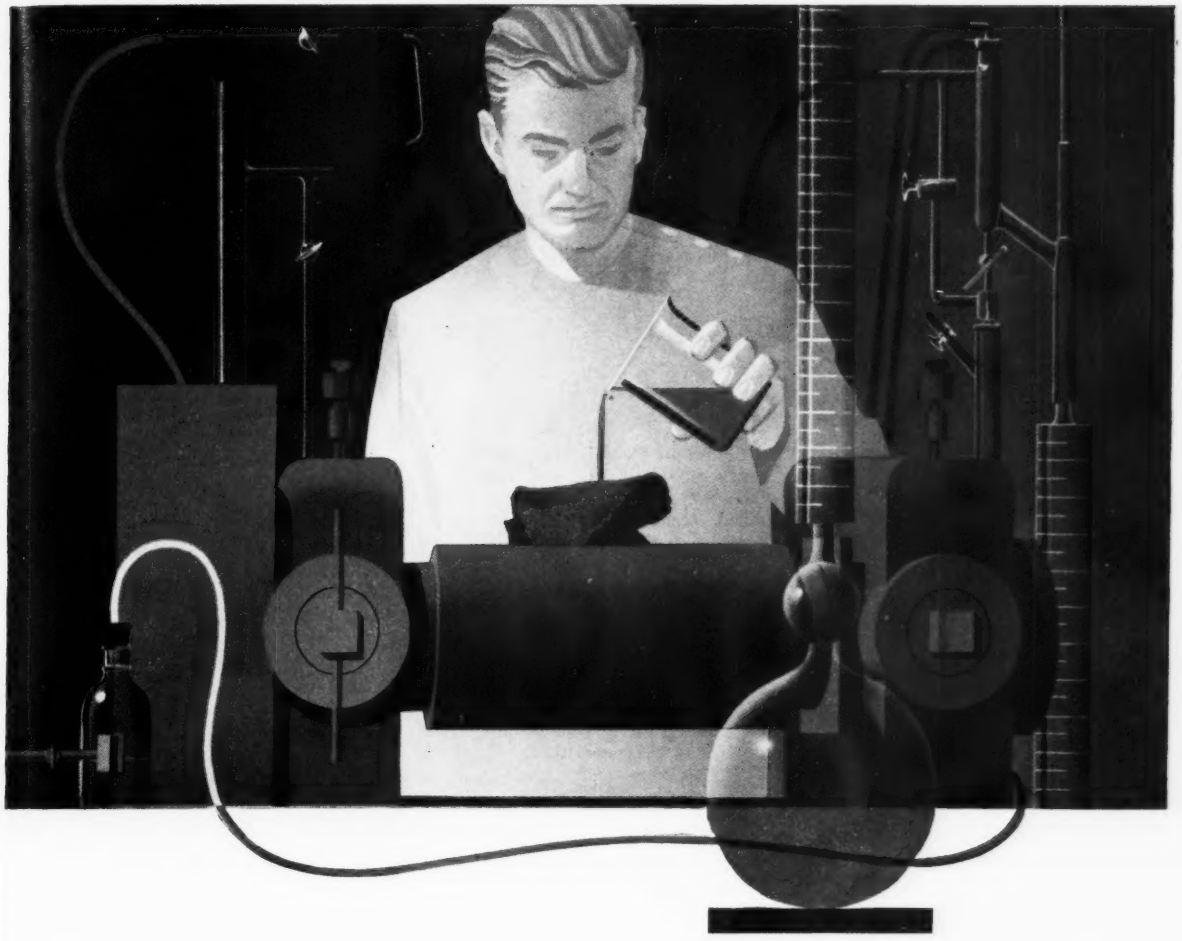
Richard B. Tucker

Richard B. Tucker, who retired in 1955 as executive vice president and member of the board of Pittsburgh Plate Glass Co., Pittsburgh, Pa., died November 26 at his home in Virginia Beach, Va.

Mr. Tucker began his business career in 1906 as manager of the John D. Gordan Co., Camaguey, Cuba. He had been an executive of Pittsburgh Plate since 1929, when he was appointed manager of glass sales. He had also served as a director of Columbia-Southern Chemical Corp., Duplate Canada, Ltd., and Canadian Pittsburgh Industries, Ltd.

The deceased also had served as secretary-treasurer and trustee of the executive committee of Jamestown Glasshouse Foundation, Inc.; director of J. W. Fecker & Co.; trustee of National Security Industrial Association; director of Pennsylvania State Chamber of Commerce; and a member of the in-

(Continued on page 560)



Our Technical Service Laboratory Will Help You Build Better Products With Neville Resins

If you are not already using Neville coumarone-indene resins in the manufacture of your rubber products, it will pay you to request the assistance of our Technical Service Laboratory. Our chemists will work with yours in choosing the exact grade to suit your need. Neville coumarone-indene resins are ideal extender-plasticizers. They aid processing and add tensile strength and durability to finished compounds. Write for details.

Neville Chemical Company, Pittsburgh 25, Pa.

Resins—Coumarone-Indene, Heat Reactive, Phenol Modified Coumarone-Indene, Petroleum, Styrenated, Alkylated Phenol • **Oils**—Shingle Stain, Neutral, Plasticizing, Rubber Reclaiming • **Solvents** — 2-50 W Hi-Flash*, Wire Enamel Thinners, Nevsolv* • **High Purity Indene.**

*Trade Name

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NEWS from ABROAD

Malaya Works To Meet Growing Rubber Demand

On November 17, Singapore prices at $1.36¾ (Straits), for first-grade rubber, reached their highest level since early October, 1955. Thereafter prices tended to slip, at one time on December 1, dipping to a low of $1.15¼, then recovered so that on December 4 the closing price was $1.20.

Naturally, the outlook for natural rubber is viewed with optimism, and Sir Leonard Paton, chairman of Harrisons & Crosfield, voiced the opinion of more than one rubber man when he stated in his annual report that all rubber produced in 1960 was likely to find an outlet.

The record shipment of 109,467 tons in October—when Russia and China between them took nearly 23% of the total—is sufficient explanation of the rise. Russia kept out of the market in the latter part of November and at last reports, dated December 5, had still bought no rubber. But China reportedly was at this time taking increased quantities. Rightly or wrongly, one gets the impression that the two countries seem to alternate their purchases: when Russia pushes her buying in Malaya, China largely holds back, to return when Russia is preparing to retire again.

SP Rubber Demand Grows

Production of Superior Processing Rubbers is just keeping pace with shipments in each grade, G. W. Drake, head of the chemical division of the Rubber Research Institute, revealed recently. Facilities for preparing the most popular grade, SP RSS, he said, must be expanded, explaining that the four estates now making it are nearing the limit of their capacity. These producers are considering methods of increasing outputs, and at the same time many agency groups have also shown interest in entering this field.

As compared with 1,149 tons in all of 1958, more than 1,870 tons were shipped in the first ten months of 1959. The 1959 exports included 1,334 tons of SP RSS, 295 tons of SP crepe, 188 tons of SP Brown Crepe, and 53 tons of SP air dried sheet. In the third quarter of 1959, Germany showed particular interest in SP RSS, taking 143.9 tons, more than the combined total bought by Britain and the United States, the next largest importers of the grade.

SP brown crepe is not meeting with ready sales, and until consumer interest is stimulated, production will be curtailed. A new grade—PA 80—was introduced in the latter part of 1959, and three tons were shipped to manufacturers for trial. The Institute can produce 15 tons a month of PA 80 and is soon to publish a technical bulletin on its preparation and properties.

Production Aids

Increased use of yield stimulants and double tapping are behind Malaya's ability to maintain the level of rubber production despite her extensive replanting program, C. W. Brookson, head of the botanical division of the Rubber Research Institute, suggests. The great majority of the larger estates and more than 50% of the smaller estates are using both methods, he believes. Many smallholders too are adopting the systems. He urged caution in regard to the application of stimulants by smallholders, since incorrect procedure can cause much damage; he also emphasized the risk of "slaughter tapping," if smallholders made too many cuts.

The Institute has been experimenting with yield stimulants since 1951 and so is able to advise on their use in estate practice. Mr. Brookson added that it is hoped to be able to increase the economic life of a tree to 35 years from the start of tapping.

Replanting Cess Raised

The Rubber Industry Replanting Board has recommended that the replanting cess on smallholder rubber exports be restored to its original 4½ cents (Straits) per pound, to insure adequate funds for continuing the smallholders' replanting program. The rate had been reduced to 2 cents per pound on September 1, 1956, as a means of returning to smallholders their share of the money collected by the anti-inflationary cess.

The anti-inflationary cess is imposed when the price of rubber goes above one dollar (Straits) per pound. When the price drops below one dollar and remains below one dollar for eight consecutive weeks, the money collected is given back, proportionately, to estates and smallholders. This cess, reintroduced in August, 1959, had gone up to 7½ cents per pound for the week starting November 26, and from August to the third week of November yielded $4,600,000.

Production and Imports

There have been conflicting opinions on possible rubber outputs in November: some look for a substantial decrease, as compared with September and October outputs, because of heavy rains; others see production maintained at normal level.

In the first 10 months of 1959, Malaya's rubber crop totaled 573,204 tons, 6% above the yield in the same period of 1958. Imports at the same time were 378,181 tons—up 12%.

Industry Improving East German Rubber

Before the war the only German tire company in what is now East Germany, was Deka-Pneumatik, East Berlin, which at the time provided 4 to 5% of total German tire output. A war casualty, the firm's tire factory at Fuerstenwalde was partly rehabilitated under Russian occupation, and early in 1947 operations could to some extent be resumed. In the next two years, tire factories were also started in Berlin, Riesa, and Heidenau; all four plants at first worked under very unfavorable conditions.

Tire Output Better

The situation improved, however, so that by 1958 total output came to 1,600,000 tires for motor vehicles and about 5,000,000 cycle tires. Besides tires for bicycles, motor cycles, and automobiles, present production includes tires for heavy duty, for airplanes, and for agricultural equipment, but efficient mass production is hampered not only by the very large number of sizes—100 reported—and the many styles, but by antiquated methods, problems which are being carefully studied at present.

Quality has been raised so that automotive tire mileages exceeding 100,000 kilometers (62,000 miles) have in some cases been recorded; while the proportion of tires unfit for retreading has been reduced. Under the seven-year plan ending 1965, further progress is to be achieved by improvement in tire cord and tread design of larger sizes, particularly of types to meet the growing needs of mechanized farming. Modern processing and control techniques are to be introduced; it is hoped

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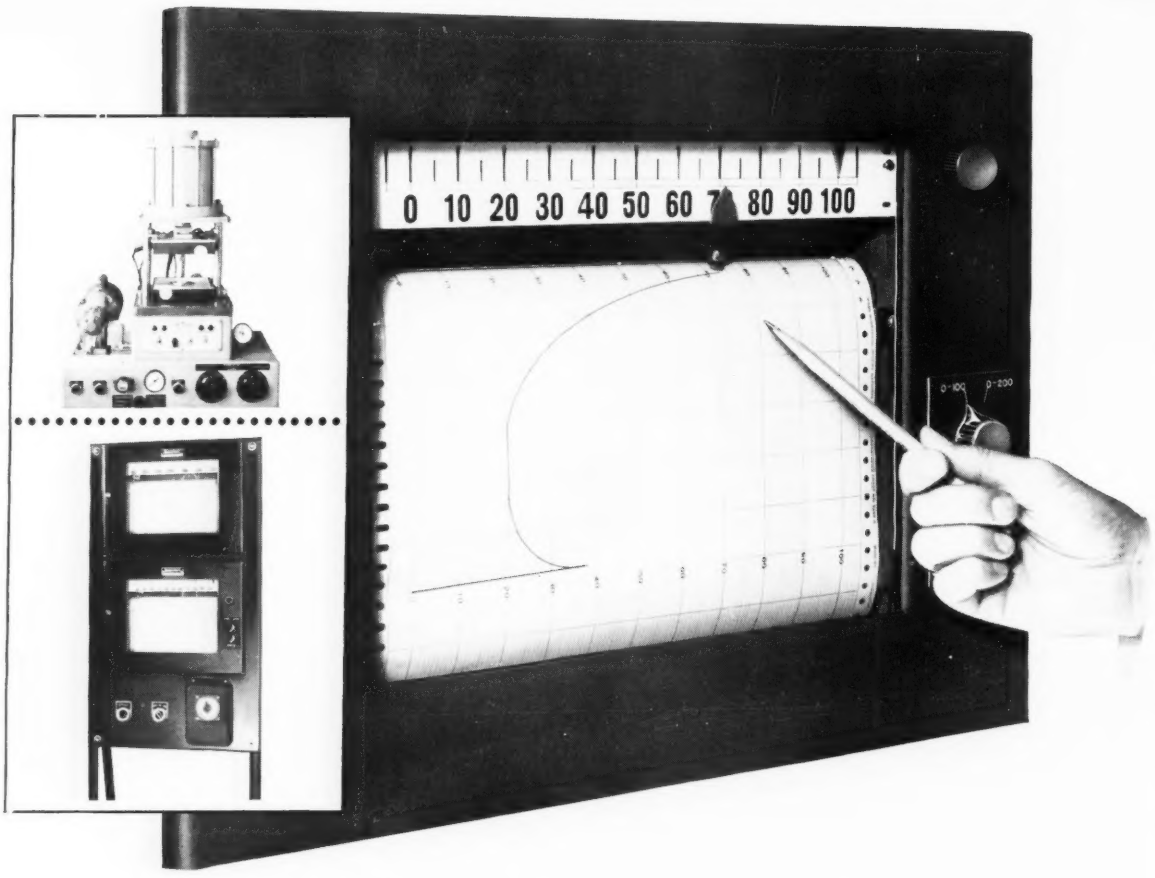

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to be able to use the Soviet rapid or hot-mixing method for direct production of semi-manufactures, and also Soviet semi-automatic tire-building equipment for heavy-duty tires.

The quality of airplane tires, it is claimed, even now is comparable to that of foreign products, but the aim is to make all East German tires competitive in all world markets and to double the 1958 output by 1965.

Other Rubber Goods Advancing

East Germany's general rubber goods industry has also advanced in the past ten years, though it admittedly still has far to go to reach the standards and range of products made in Russia and Czechoslovakia, and the seven-year plan stresses modernization of methods in this section too, with efforts to be concentrated chiefly on conveyor and V-belts, lined and unlined hose, footwear, foam rubber, and thread. Russia and Czechoslovakia are giving technical aid in the production of belting made with synthetic rubber and polyamide fiber, as well as of lined and unlined hose.

Methods for making continuous extrusions from chemically blown sponge are being developed. A new foam rubber factory with four times present output capacity and in which much synthetic latex will be used is in prospect, and a reclaimed rubber factory with annual output capacity of 20,000 tons is also to be built.

Synthetic rubber is supplied by VEB Chemische Werke Buna, Schkopau. This concern provided considerable quantities of Buna S and Buna 85 during the war, reaching a record 18,700 tons in the last quarter of 1943. War damage caused output to drop to 7,200 tons in the same quarter of 1944. In 1946, 25,000 tons were reportedly produced, and 31,000 tons in 1949. Plans call for an increase of 285% in 1959, as compared with 1949 output. Incidentally, this company also makes PVC, polystyrene, and plasticizers, among other materials. Output in 1949 included 9,300 tons, 600 tons, and 2,000 tons respectively and 1959 is expected to show increases to about 45,000 tons, 3,600 tons, and 5,200 tons, respectively.

Technical Courses

To aid the rubber and high polymer industries, appropriate courses in physics and chemistry as well as in processing technology are to be given at the Technical Institute of Dresden, and the Technical Institute for Chemistry at Halle, Merseburg; special centers for research and development for the rubber and tire industries have recently been established.

German Conference To Be Held in October

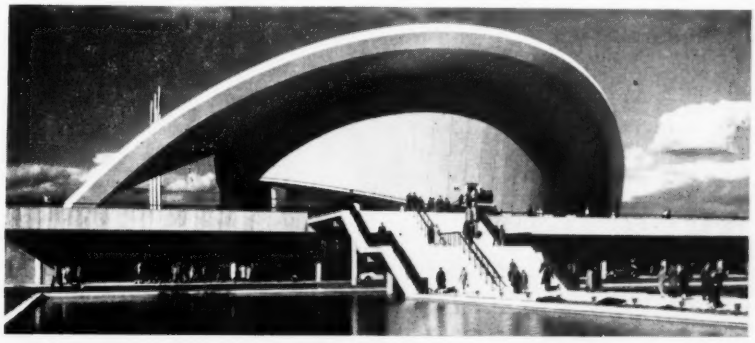
Deutsche Kautschuk - Gesellschaft will hold an International Rubber Conference in West Berlin Kongresshalle, West Berlin, Germany, October 4 through 7, 1960. This will be the next general meeting and lecture conference of the organization.

Papers will be presented by both German authors and others from foreign countries. Special lectures are still invited, and any persons interested may write the DKG Geschaftsstelle, Frankfurt/Main, Mainzer Landstrasse 66, Germany, prior to January 31.

The preliminary conference program calls for the general meeting for members only to be held at 4:00 p.m., Tuesday, October 4. The first of the lectures will be held on Wednesday morning with plenary lectures. The sessions for special lectures with discussion will be held Wednesday afternoon, all day Thursday, and all day Friday.

The social evening will be held on Friday October 7, in the "Palais am Funkturm." Topical films on rubber will be held on the afternoons of October 5 and 6.

The conference will also feature an exhibit at which German and foreign manufacturers will show processing and testing machinery for the rubber and plastics industries.



West Berlin Kongresshalle which will be the site of the October, 1960, International Rubber Conference being sponsored by the DKG

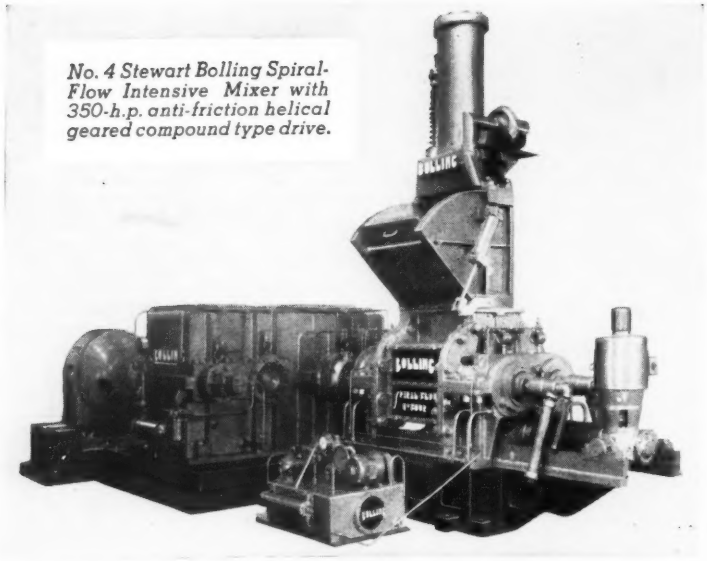
Pelletized News

NEVILLE CHEMICAL CO., Pittsburgh, Pa., a leading producer of hydrocarbon resins, plasticizers, and solvents, and Teerunie N.V., Uithoorn, Holland, a large producer of tar, asphalt, and chemical products, have established a jointly owned company to manufacture and market hydrocarbon resins and solvents for the European market. The new company is Neville Cindu Chemie N.V. and will provide customers with a new and more complete source of resins and solvents, as well as the combined research facilities of the two parent companies. Construction of the new plant has been underway for several months at Uithoorn, with completion slated for late 1960. Until operations begin, Neville Cindu Chemie will market Neville products in Europe and will also handle the sale of Teerunie's current production of coumarone-indene resins.

NAUGATUCK-RUMIANCA, S.P.A., a recently formed company jointly owned by United States Rubber Co. and Rumianca Co., one of Italy's largest chemical firms, has begun operations of a newly built plant in Borgaro Torinese, a suburb of Turin, Italy. It is currently producing tonnage lots of B-L-E, an antioxidant developed by U. S. Rubber's Naugatuck Chemical Division. Scheduled for early production is Polygard, a non-staining stabilizer which is also a product of The Naugatuck Division. These two products will be followed by a complete line of antioxidants, accelerators, and specialty chemicals for Europe's rubber industry which has grown spectacularly during the past decade.

DUNLOP'S second Indian tire factory was opened last February at Ambattur, near the port of Madras. The new factory, which cost £1,800,000, was undertaken in connection with the road transportation aims envisaged in India's Second Five-Year Plan. It will produce 2,000,000 cycle tires and 134,000 giant tires annually, giving employment to 600 persons. The older Dunlop establishment at Sahaganj, near Calcutta, produces automobile tires and inner tubes, in addition to other rubber goods.

FORTH CHEMICALS, LTD., Grangemouth, Stirlingshire, Scotland, has approved plans to expand its monomeric styrene manufacturing plant. The plans call for increasing plant capacity to about 50,000 tons per year over the next 12-month period. Output of the plant is used in the manufacture of polystyrene, synthetic rubber, paints, and resins. Forth Chemicals is jointly owned by British Hydrocarbon Chemicals, Ltd., and Monsanto Chemicals, Ltd.



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News from Abroad

B. F. GOODRICH AUSTRALIA, PTY. LTD., The B. F. Goodrich Co.'s new Australian subsidiary, began tire production in December, three months ahead of schedule. Tires manufactured in the new plant near Melbourne will go on sale in Australian markets in March. The company is a partnership between BFG and Ampol Petroleum, Ltd., of Australia. First commercial production of the new $6.5 million plant will be passenger tires, followed soon by commercial and truck sizes. Output is initially at the rate of 1,100 to 1,200 tires a day, using synthetic rubber extensively.

C. & J. CLARK, LTD., Somerset, England, has developed a process for the direct molding of shoes with microcellular soles and heels. These soles, for which natural and synthetic rubbers are used, have a tread surface consisting of a tough, hard-wearing, smooth skin of high-density rubber, a center portion with unconnected cell structure, and a final smooth skin forming the insole of the shoe. The secret of the process is said to lie in the design of the mold as well as in the compound and in the proper control of the blowing process to insure the desired structure.

AMOCO CHEMICALS CORP., Chicago, Ill., has appointed Kingsley & Keith, Ltd., exclusive distributor for the United Kingdom, Northern Ireland, and Eire for Amoco Indopol polybutenes. The firm will work closely with Dr. A. J. Skey, European representative for Amoco Chemicals, who is located in London. Kingsley & Keith will handle all ten grades of Indopol polybutenes, which are light-colored, viscous, aliphatic hydrocarbon resins widely used in calking and sealing compounds, adhesive tapes, electrical cable oils, rubber goods, and as special lubricants.

SOUTH VIETNAM'S rubber exports for the first eight months of 1959 reached 42,048 tons, 3,835 tons more than for the corresponding period of 1958, it is learned from press reports.

R. B. Tucker

(*Continued from page 554*)

ternational relations committee, National Association of Manufacturers.

Mr. Tucker was born in Norfolk, Va., 73 years ago.

He is survived by his wife, two daughters, a son, ten grandchildren, four brothers and three sisters.

Funeral services were held November 29 in the Eastern Shore Chapel, Virginia Beach, with burial in the Chapel cemetery.

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TECHNICAL BOOKS

BOOK REVIEWS

"Plastics Technical Dictionary. Vol. II: German-English." A. M. Wittfoht. Bound in plastic, 5 x 7½ inches, 573 pages. Carl Hanser Verlag, Munchen, West Germany. 1959. Price 58 DM.

This is a second, revised, and enlarged edition of "Vol. I: English-German," which was published in 1956. In spite of considerable enlargement the original structure has been maintained: this edition contains definitions, diagrams, abbreviations, conversion tables, and nomenclature used in processing, fabricating, and using plastics, in testing and mold construction. This book will be a great help to all those in the plastics industry concerned with international cooperation who are compelled to deal in other languages and to think in a foreign terminology.

The part comprising the dictionary itself offers not only literal translation, but attempts to explain linguistic and technical relations by giving definitions, contexts, cross-references, etc. When dealing with terms on test methods and properties, English and German units of measurements are given as far as possible as well as standard references and particulars as to whether they are comparable or not.

Bibliographic references are quoted in the case of recent developments or specialized terms. Trade names have been included where it appeared to be necessary, particularly for processes and machinery. Explanations were arrived at from studying the literature, the Standard Specifications in the respective countries including ISO recommendations, and from detailed discussions with experts.

The appendix contains illustrated sections of processes and machinery which are built up systematically: fabricating; presses and molds; molding processes; mixers; plus a list of general and technological abbreviations and tables of conversion and comparison. This edition, including both volumes, provides a comprehensive dictionary in both languages covering the entire field of plastics technology.

"Source Book of the New Plastics." Volume 1. Herbert R. Simonds. Cloth cover, 6¼ by 9¼ inches. Reinhold Publishing Corp., New York. Price $10.00.

This book covers the properties, production, price, use, and selection of the latest improvements in established materials and new plastic materials. It also includes sections on federal-sponsored research and a patent survey.

Following a brief résumé of the most recent developments in each class of plastics, the book contains articles prepared by the producing companies about the particular new developments or products that they have made. Sixty companies are represented in this series of articles.

New materials covered include seven new primary plastics introduced in 1958. The latest improvements in established plastics are covered, and the 100 most important patents issued in the plastics field during 1958 are described.

The book is designed to be a continuation of the author's famous "Concise Guide to Plastics" and to give specific, accurate, and practical answers to whatever your question, need, or interest in new plastic materials.

"Huber Calcined Clays for the Rubber Industry." J. M. Huber Corp., New York, N. Y. 8 pages. This bulletin presents the physical and chemical properties of Polyfil 40, 70, and 80 calcined clays and shows the relative reinforcing effects in SBR, neoprene, smoked sheets, and in butyl rubber.

NEW PUBLICATIONS

"Richardson Formula Capsule." Products Data Sheet 5904. Richardson Scale Co., Clifton, N. J. 2 pages. A formula capsule which eliminates manual errors in blending, proportioning, and batching operations by taking formulation out of the hands of the operator and automatically setting correct proportions of materials is described in this data sheet. It tells how this new pocket-size unit programs the weighing of up to 24 solid and/or liquid ingredients. The equipment is illustrated with photographs and drawings.

"The Mixing Magic Born at Baytown." United Carbon Co., Inc., New York, N. Y. 6 pages. This new folder reviews in laymen's terms the first commercial production of carbon black-styrene butadiene rubber masterbatches, outlines typical applications, and points up the essential results derived by consumer and fabricator. It also contains a simple manufacturing process flowsheet and a short technical explanation of the masterbatch process.

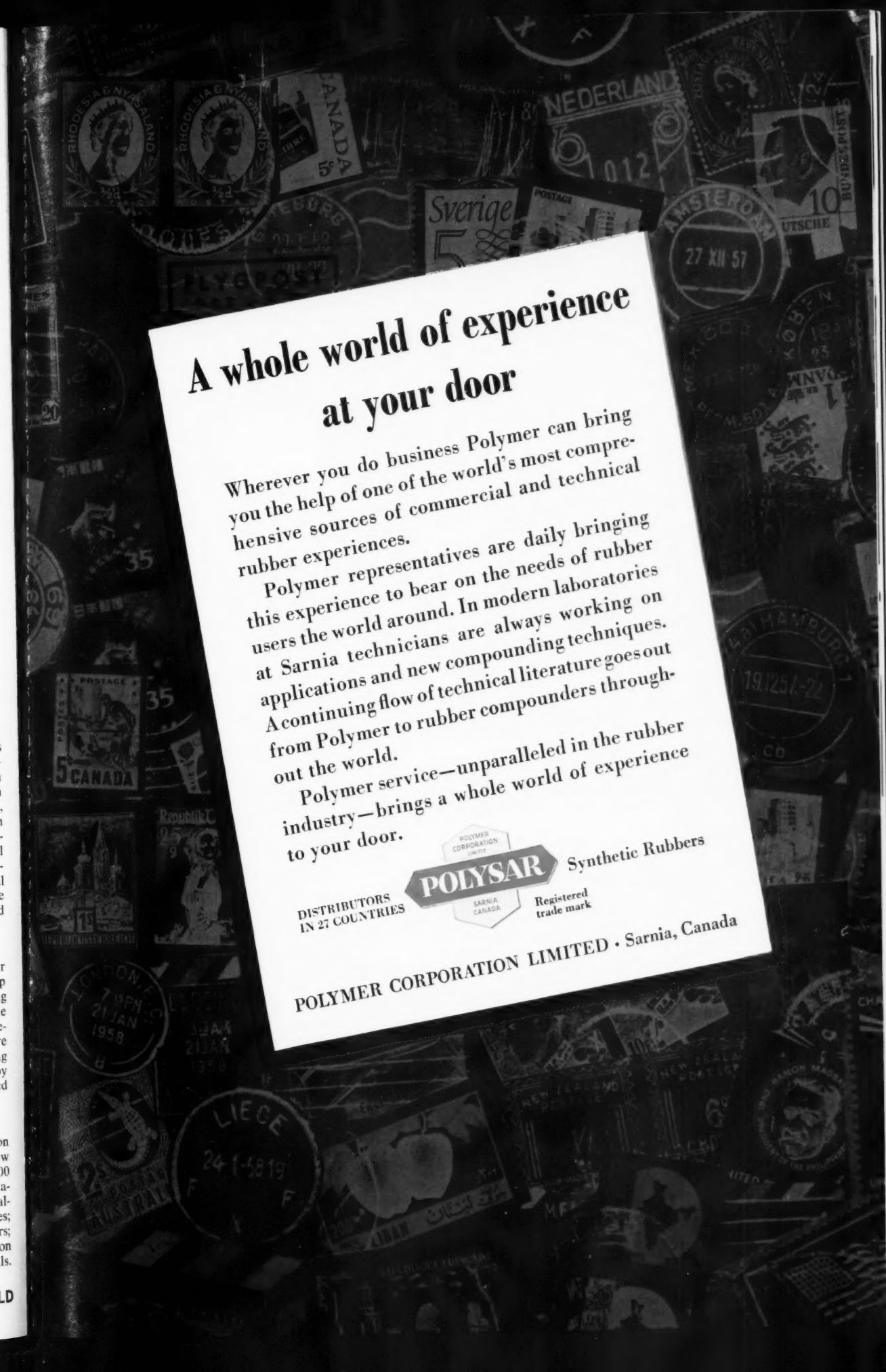
"A Comparison of the Physical Properties and Processing Characteristics of Typical S-Polymers." Bulletin SC:59-89. Synthetic rubber division, Shell Chemical Corp., Torrance, Calif. 12 pages. This bulletin compares the company's styrene-butadiene copolymers, showing (1) the relative accelerator level each needs in a constant optimum cure (2) a comparison of physical properties, (3) the relation among scorch times. Use of these data can help in choosing the best rubber for a particular purpose.

"Ty-Ply Rubber-to-Metal Vulcanizing Adhesives." Adhesives Bulletin No. 1. Marbon Chemical, division of Borg Warner Corp., Washington, W. Va. 10 pages. Ty-Ply types, general and detailed methods of use, bond characteristics, and tie cements have been explained from the standpoint of practical usefullness to the user. This technical report represents the first of several, now in preparation, designed to give the user the latest practical information on Ty-Ply adhesives.

"A Compendium of Six Papers on Natural Rubber." The Natural Rubber Bureau, Washington, D. C. 68 pages. This booklet contains six papers which were presented at the International Rubber Conference, November, 1959, extracted from the proceedings of the conference, by members of the research staffs of the British Research Institute, Kuala Lumpar, Malaya, and the British Rubber Producers' Research Association, Welwyn Garden City, Herts, England. The titles of the papers are: "Recent Developments in the Production and Processing of Natural Rubber in Malaya"; "Recent Developments in Superior Processing Natural Rubber"; "*Cis-trans* Isomerization in Natural Polyisoprenes"; "Reinforcement of Rubber by Fillers"; "The Role of Hysteresis in Tire Wear and Laboratory Abrasion"; and "Polymerization of Vinyl Monomers in Rubber Latices."

"Tall Oil Bibliography." Published by The Institute of Paper Chemistry, under the sponsorship of the Tall Oil Division, Pulp Chemicals Association, New York, N. Y. 450 pages. Covering subjects from abietic acid to zinc treatment, a new complete "Tall Oil Bibliography" discusses the preparation, properties, reactions, and applications of tall oil and its derivatives. More than 1,600 articles, reviews, and patents are included covering the literature to the end of 1957. The bibliography is indexed by subjects, authors, and patents. Almost 1,000 patents are indexed from the United States, Europe, and Russia.

"Physical Properties—Synthetic Organic Chemicals." Union Carbide Chemicals Co., division of Union Carbide Corp., New York, N. Y. 28 pages. This new booklet describes more than 400 synthetic organic chemicals, containing information on applications, physical properties, and shipping data. Included are alcohols; acids; anhydrides; chlorine compounds; esters; ketones; monomers; nitrogen compounds; ethers and oxides; glycol ethers; glycols and triols; cyclic compounds; Flexol plasticizers; Ucon fluids, lubricants, and fluorocarbons; and many other chemicals.



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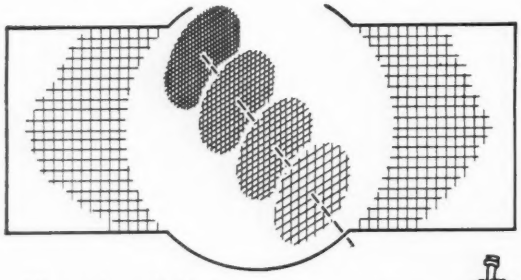

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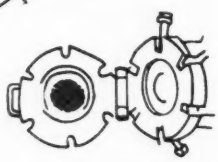

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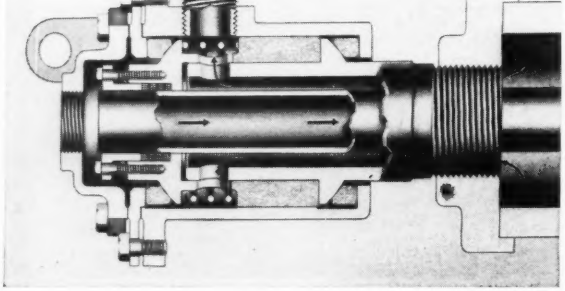
Type SN Johnson ROTARY PRESSURE Joint

There's not another rotary joint like the Johnson Type SN. Used where inlet or outlet pipe must rotate with the roll—on certain paper machines, drilled rolls of rubber or plastic mills and calenders, double shell dryers, and the like. Needs no external supports of any kind. Like all Johnson Joints the Type SN seals without packing, needs no lubrication or adjustment.

Investigate Johnson Joints for all steam-heated or water-cooled rolls. Handle Dowtherm, Monsanto Aroclors, hot oils too. Sizes to 8". For data on Type SN write for Bulletin N-2002.

THE JOHNSON CORPORATION
869 Wood St., Three Rivers, Michigan



Technical Books

Publications of the elastomer chemicals department, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.:

"Aqueous Adhesive for Bonding Elastomers to Synthetic Fabrics." BL-361. By C. H. Gelbert. 4 pages. This bulletin describes an adhesive based on Hylene MP and Neoprene Latex Type 673 which is said to be excellent for bonding neoprene or SBR to nylon or Dacron fabrics. Compounding, effect of curing conditions, type of neoprene latex, application of adhesive to fabric, and other data are given.

"Oil Extension of Neoprene Latex." BL-362. By R. O. Becker. 4 pages. Low-cost neoprene latex compounds can be prepared by the addition of rather large amounts of oil emulsion to the latex. Emulsification of the oil, selection of the oil, effect of oil extension on film properties, and properties of oil-extended neoprene latex films are topics covered in this bulletin.

"'Viton' in Mechanical Goods." BL-360. By T. D. Eubank and E. Tufts. 16 pages. In the short time since "Viton" was introduced commercially, it has been utilized in a wide variety of products. Many technological advances have been made since publication of the introductory literature. These include the development of a new polymer, "Viton" B, and of new safer processing curing agents, Diak No. 2 and LD-214. In addition, processing and fabrication techniques have been developed which facilitate the use of "Viton" in a broader range of end-products. These developments and techniques are described in this bulletin.

Direct Molded Footwear

(Continued from page 525)

for making certain staple types of footwear such as men's work shoes, women's lightweight shoes and casuals, and certainly these will be followed by large-scale production of children's and boys' shoes. Once exposed long enough to real American ingenuity, direct molded footwear may very possibly be made acceptable to an increasingly wider range of domestic styles and types.

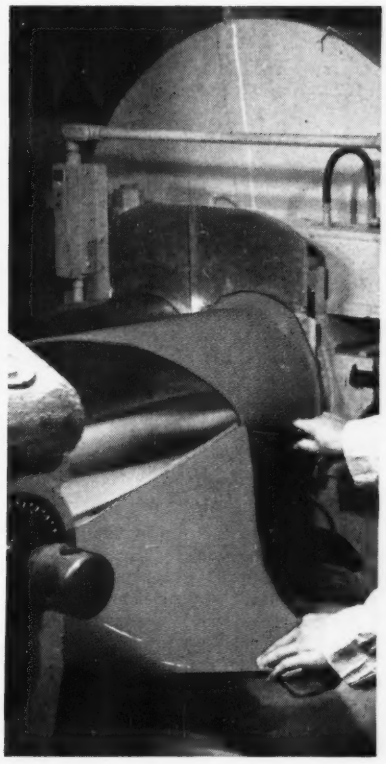
Direct molded footwear has many advantages over conventional footwear. In addition to making a more durable and serviceable type of shoe, DMS offers considerable savings in labor due to the elimination of many operations (more than 20 in men's work shoes); and also the material savings due to the elimination of as many as 15 component parts in men's work shoes; also appreciable savings result from a reduction of floor-space requirements.

It is now possible to make a truly waterproof shoe, an accomplishment sought after for many years. Direct molded footwear makes a completely waterproof seam between the leather upper and the vulcanized rubber bottom. A special new silicon oil treatment for leather uppers causes leather to repel rather than absorb water. This waterproofing treatment not only promotes longer leather life, but most significantly does not affect the natural porosity of leather; "it still breathes". The large retail merchandising chains are featuring hunting boots of this-type construction very successfully, and are selling a considerable volume of them.

Possibly the largest potential market, children's and boys' shoes, has not yet been tapped. The extremely wide and successful development along those lines in England may well be duplicated in the United States.

Direct molded footwear is definitely here to stay.

New Base For New Products



SILASTIC® SILICONE RUBBER Solvent-Resistant Masterbatch

For the first time solvent-resistant silicone rubber can be compounded by the rubber fabricator to his exact needs, through the use of new Silastic LS-122 Base. This masterbatch consists of a fluorocarbon silicone polymer and reinforcing silica.

Fuel, oil, and solvent-resistant stocks with hardnesses up to 80 durometer may be formulated from Silastic LS-122 Base. Elongation, tensile strength and other physical properties can be varied. In effect, this new base allows you to tailor-make stocks to meet your customer's requirements. Yet you need inventory only the one masterbatch.

Solvent resistance of stocks compounded from this base is comparable to that of the Dow Corning LS series. The photo at right above shows how little swell results when an extrusion of a stock made from LS-122 base is immersed for 24 hours in JP-4 jet fuel. Note swelling of regular silicone rubber part that was the same size at the start of the test.

Silastic LS-122 base processes easily during compounding . . . bands quickly, doesn't crumble, accepts fillers readily, can be stripped from mill rolls with a knife. Finished stocks can be molded, calendered or extruded. Even the most complex extruded shape is sharp and clear as shown in photo at above right. Write Dept. 9401a for full details.

Sample Recipes and Typical Properties

. . . For 50 Durometer Stock	
Silastic LS-422 Base	100 parts
Luperco CSF or Cadox TS-40	2 parts
Hi Sil X303	8 parts
* Durometer (Shore A)	50
Tensile Strength, psi	1000
Elongation, %	200
% Swell after 77 hrs @ 300 F in ASTM No. 3 Oil	5
. . . For 75 Durometer Stock	
Silastic LS-422 Base	100 parts
Luperco CSF or Cadox TS-40	2 parts
Hi Sil X303	5 parts
Super Neo Navacite	90 parts
* Durometer (Shore A)	75
Tensile Strength, psi	500
Elongation, %	120
% Swell after 77 hrs @ 300 F in ASTM No. 3 Oil	5

* Vulc. 5 min @ 240 F; cured 24 hrs @ 300 F.

Your nearest Dow Corning office is the number one source for information and technical service on silicones.

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Dow Corning CORPORATION
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

MARKET REVIEWS

Natural Rubber

During the November 16-December 15 period the outstanding feature of the natural rubber market was the gradual reduction in the absurdly high premium demanded for nearby RSS #1. This leveling out of prices brought values of most grades generally down to a somewhat lower level.

In Singapore outstanding commitments for November shipment appear to have been met either by outright covering or by postponement of shipment by mutual agreement. It is believed that Russian shipments have been completed and that sales to China have been fairly high. There have been no confirmed reports of new buying for Russian or Chinese accounts. At the time of writing, therefore, it seemed likely that in December there would be no serious shortage of natural rubber.

In New York the November Rex contract expired without any excitement; so did November contracts in London. The situation in London seems to indicate that positions have been squared, and new buyers of near rubber failed to appear. That this condition is due to sales from the stockpile is doubtful, as only a comparatively small quantity of the 12,474 tons announced as sales by the B.O.T. up to the end of November was sold for prompt delivery.

The sales in the United States by the GSA for the same period, given as 12,650 tons, seem disappointing to many interested people.

In the changed circumstances the markets have tried to adjust themselves. In Singapore on the lower price level interest has shifted back to offgrades, resulting in a narrowing of differentials; whereas in both London and New York dealings in physical rubber have been limited. The terminal markets have attracted almost all interest.

All markets have worked under difficult conditions with wide and erratic price fluctuations. At the time of reporting they were still extremely nervous and vulnerable to manipulations.

November sales, on the New York Commodity Exchange, totaled 18,940 tons, compared with 13,780 tons for October contract. There were 19 trading days in November, and 21 during the November 16-December 15 period.

REX CONTRACT

	Nov. 20	Nov. 27	Dec. 4	Dec. 11
Nov 1960	45.50	....	....	....
Jan.	43.10	41.59	41.30	41.20
Mar.	39.80	39.35	39.50	39.20
May	38.70	38.25	38.50	37.85
July	38.00	37.25	37.50	37.00
Sept.	37.40	37.00	37.00	36.60
Nov.	37.00	36.50	36.50	36.20
1961 Jan.	....	36.00	36.00	35.80

On the physical market, RSS #1, according to the Rubber Trade Association of New York, averaged 43.43¢ per pound for the November 16-December 15 period. Average November sellers' prices for representative grades were: RSS #3, 44.15¢; #3 Amber Blankets, 40.77¢; and Flat Bark, 38.23¢.

NEW YORK OUTSIDE MARKET

	Nov. 20	Nov. 27	Dec. 4	Dec. 11
RSS #1	45.50	43.25	41.75	41.50
#2	45.25	43.00	41.50	41.38
#3	45.00	42.75	41.25	41.25
Pale Crepe #1 Thick	49.75	48.00	48.25	48.00
Thin	49.25	47.50	46.75	46.50
#3 Amber Blankets	41.50	40.25	40.50	40.50
Thin Brown Crepe	41.25	40.00	40.25	40.25
Standard Bark Flat	39.00	37.75	37.50	37.00

Synthetic Rubber

The rubber industry scored a number of new records in 1959, according to a recent report of The Rubber Manufacturers Association, Inc. This industry is expected to do even better in 1960.

New 1959 peaks, based on preliminary estimates for 10 months of actual record, include (previous records in parentheses): consumption of 1,615,000 long tons of new rubber (1,529,699 in 1955); consumption of more than 1,000,000 L. T. of synthetic rubber (925,879 in 1957); consumption of more than 1,000,000 L. T. of new rubber in tires and tire products (959,856 L. T. in 1955); production of more than 1,300,000 L. T. of synthetic rubber (1,118,173 L. T. in 1957); and synthetic rubber exports of more than 280,000 L. T. (203,468 L. T. in 1957).

Synthetic rubber accounts for 66% of the industry's new raw material requirements; however, the remaining 34% of natural rubber used in the United States represents a substantial tonnage and at current prices a costly raw material.

In forecasting for 1960 one source expects synthetic rubber consumption to be nearly double that of natural rubber; of the estimated 1,665,000 long tons of rubber to be consumed in 1960, 1,097,000 tons would be synthetic rubber.

In an interview, C. F. Ruebensaal, director, commercial development for Texas-U. S. Chemical Co., estimated that the synthetic rubber industry is running at about 95% of actual capacity and about 85% of theoretical capacity. He noted that total capacity of all types is in the neighborhood of 1,685,000 tons. SBR capacity is about 1,390,000 tons; butyl about 105,000 tons; N types, 65,000; and neoprene about 125,000 tons.

Latex

With the recent downward trend in the value of dry rubber during the November 16-December 15 period, buyers of latex rubber have been inclined to hold off in the expectation of still lower prices. Apart from some small consumer covering for nearby shipment, the drum latex market has, on the whole, been somewhat quiet. Sellers of a few lots have appeared for reasonably early shipment of what is presumed to be excess production. This has been sufficient to cause reduction in the ruling price differential. The market for bulk latex continues steady, with little activity reported.

Malayan production in October reached 11,428 tons, compared with 11,111 tons in September, bringing the total for the first 10 months of 1959 to 101,754 tons, against 97,201 tons in the corresponding period of 1958.

Prices for ASTM centrifuged concentrated natural latex, in tank-car quantities, f.o.b., rail tank car, ran about 47.00¢ per pound solids. Synthetic latices prices were 26.0 to 40.25¢ for SBR; 37 to 57¢ for neoprene; and 45 to 60¢ per pound for the nitrile types.

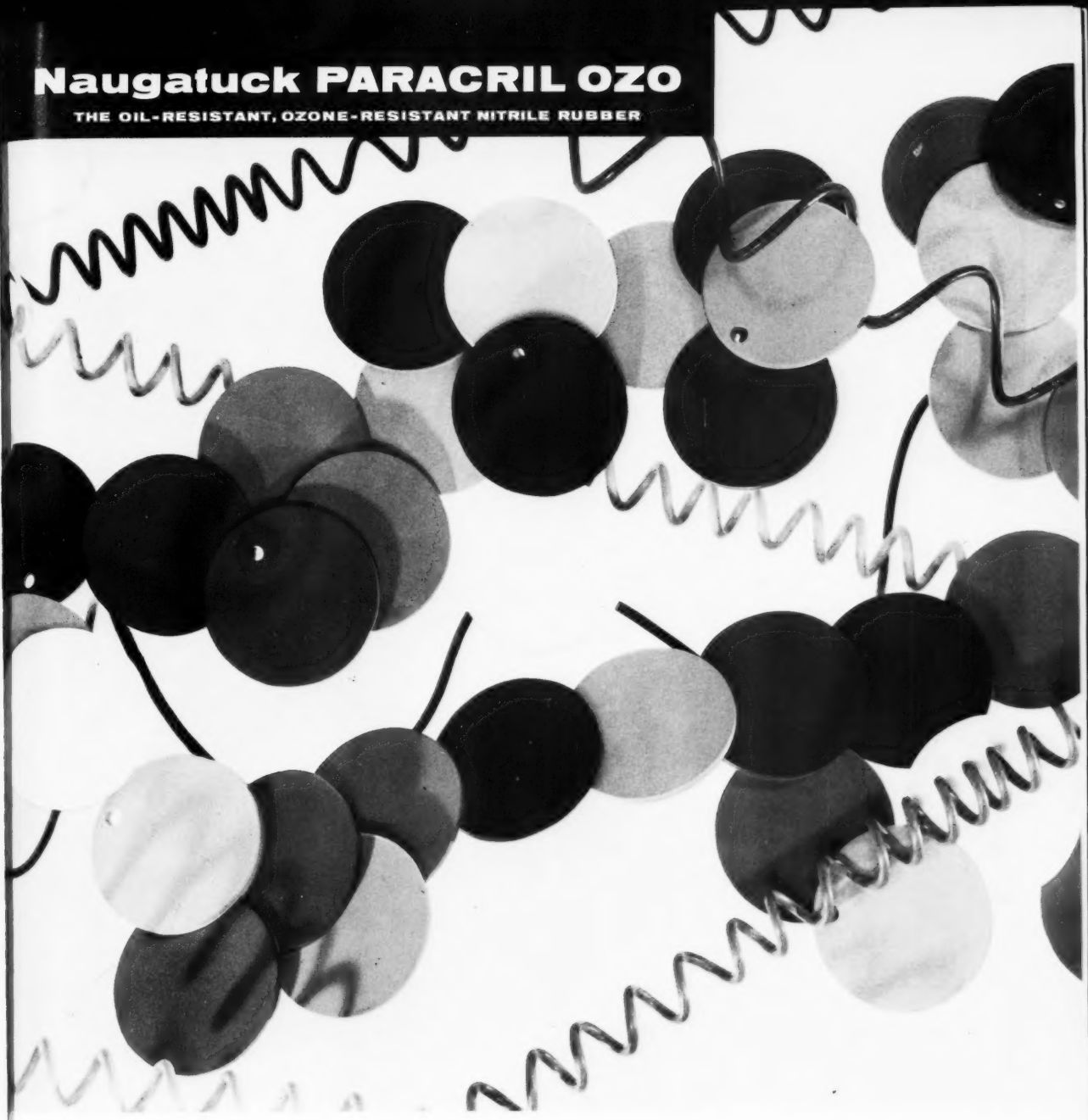
(All figures in long tons, dry weight)

Type of Latex	Production	Imports	Consumption	Month-End Stocks
Natural				
Sept.	0	6,947	6,342	11,742
Oct.	0	*	6,153	12,220
SBR				
Sept.	8,201	—	6,919	7,196
Oct.	9,424	—	7,388	7,570
Neoprene				
Sept.	956	0	910	1,498
Oct.	1,020	0	969	1,464
Nitrile				
Sept.	1,364	0	1,178	2,810
Oct.	1,187	0	1,158	2,888

* Not available yet for period covered.

Naugatuck PARACRIL OZO

THE OIL-RESISTANT, OZONE-RESISTANT NITRILE RUBBER



Need color in a weather-resistant rubber product?

PARACRIL® OZO will give you all the color you want... any color... permanent, gleaming color for every kind of rubber product, from electric wire to oil pump hose to shoe soles.

Now you can give your product powerful extra selling features... color that attracts, that warns, that identifies, that helps emphasize or hide.

Along with color, PARACRIL OZO gives you a combination of weather resistance, abrasion resistance, oil resistance, flex life and other valuable rubber properties far surpassing conventional weather-resistant rubbers.

See if your product doesn't call for PARACRIL OZO. To find out more about this proven new rubber and the properties it offers your product, contact your Naugatuck Representative or write us today.

Naugatuck Chemical

Division of United States Rubber Company

110P Elm Street
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US RUBBER

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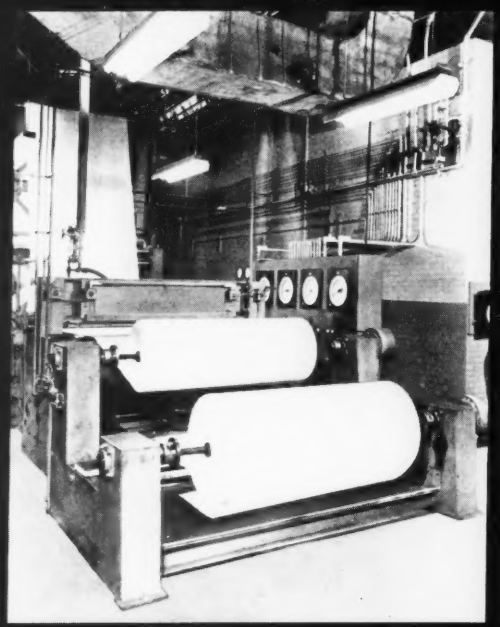

TEN THOUSAND TONS OF TOP-NOTCH TIRE CORD A YEAR

A smooth-running production line with the ability to produce more than 20,000,000 pounds of precisely treated tire cord in 'round-the-clock operation makes sweet music to everyone in the plant — from the production operators to the board of directors.

Such equipment is *not* developed by following dated rules of thumb in design . . . by incomplete attention to tough engineering problems . . . by cutting construction corners . . . or by lack of focus on tomorrow's trends in process and materials.

Whether your need is for a large volume unit or small . . . single, dual or triple-zone treatment . . . for medium speed or truly high-speed operation . . . for handling conventional or "horizon" fibers . . . avail yourself of the broad experience of the forward-thinking engineers of the C. A. Litzler Co.— designer and builder of the world's most productive tire cord installations . . . around the globe.

C. A. LITZLER CO., INC.

SOUND ENGINEERING FOR TOMORROW'S PRODUCTION

1817 BROOKPARK RD. CLEVELAND 9, OHIO CABLE "CALITZ"

EXPORT REPRESENTATIVE: GILLESPIE & CO. OF N. Y., 96 WALL ST., NEW YORK 5, N. Y.

LICENSED FABRICATORS: Benno Schilde Maschinenbau A. G. Bad Hersfeld, Germany; Soc. Alsacienne de Constructions Mecaniques Paris, France; Mather & Platt, Ltd. Manchester, England

Reclaimed Rubber

A reclaimer in the East reported that there was a significant effect felt in the reclaimed rubber industry during the November 16-December 15 period. Not this reclaimer's customers, but its customers' customers, or even farther back, felt the lack of steel and started to cut back in other requirements. The volume of sales in this period declined from the high levels of September and October. This volume is expected to pick up again in the next period.

Another reclaimer, in the Midwest, reported that business slowed up considerably during the period under review as a result of the effects of the steel strike upon its customers. The reclaimed business was still slow at the time of reporting, but it was expected to pick up again as the automotive plants swing into full production.

Another reclaimer reported that owing to the announcement of a recent price increase of 14¢ per pound on butyl reclaim as well as black natural rubber inner-tube reclaim, substantial shipments in these types were made in November. With some contemplated vacations over the holidays, it was not expected that there would be an increase in business until after the first of the year.

RECLAIMED RUBBER PRICES

Whole tire, first line	$0.11
Third line	.1025
Inner tube, black	.17
Red	.21
Butyl	.15
Light carcass	.22
Mechanical, light-colored, medium gravity	.155
Black, medium gravity	.085

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and specific gravity, at special prices.

Industrial Fabrics

Some transitional developments took place in the industrial grey cotton goods market during the November 16-December 15 period. Though only a trickle at the start of this period, new orders have come to mills, some booking January-February production, others confined to January. Buyers have also anticipated deliveries, finding renewed ability to obtain steel and consequential need of cotton goods.

More instances arose, it was reported, though not significant ones, of resale yardages coming on the market. Since sellers initiated offerings, it followed that some concession prices were noted. But the yardages, being small, were no indication of an oversupplied situation.

Fabrics that had been scarce before, such as 58-inch 1.06-yard broken twills, were a little more procurable. This had been so of the 54-inch 1.14-yard that sold at a fraction under the firm first-hand levels. Osnaburgs showed up in odd quantities; qualities have much to do with departures from accustomed quality quotations.

Mills have been in better positions because customers have been taking shipments as initially scheduled. The observation is made that buyers have use for what is being delivered.

Industrial Fabrics

Drills*

59-inch, 1.85, 68x40	yd.	$0.385
2.25, 68x40		.325

Broken Twills*

54-inch, 1.14, 76x52	yd.	.52
58-inch, 1.06, 76x52		.585
60-inch, 1.02, 76x52		.5825

Osnaburgs*

40-inch, 2.11, 35x25	yd.	.2275
3.65, 35x25		.1525
59-inch, 2.35, 32x26		.295
62-inch, 2.23, 32x26		.305

Ducks

Numbered Duck†

List less 45%

Enameling Ducks*

	S. F.	D. F.
38-inch, 1.78 yd.	$0.3263	.3313
2.00 yd.	.275	.28
51.5-inch, 1.35 yd.	.45	.47
57-inch, 1.22 yd.	.4838	.50
61.5-inch, 1.09 yd.	.5413	.5538

Hose and Belting Ducks*

Basis	lb.	.60

Army Duck†

52-inch, 11.70 oz., 54x40 (8.10 oz./sq.yd.)	yd.	.5925

Sheeting*

40-inch, 3.15, 64x64	yd.	.2175
3.60, 56x56		.185
52-inch, 3.85, 48x48		.235
57-inch, 3.47, 48x48		.245
60-inch, 2.10, 64x64		.365
2.40, 56x56		.3275

Sateens*

53-inch, 1.12, 96x60	yd.	.6275
1.32, 96x64		.56
57-inch, 1.04, 96x60		.615
58-inch, 1.02, 96x60		.68
1.21, 96x64		.61

Chafer Fabrics*

14.40-oz./sq.yd. P.Y.	lb.	.71
11.65-oz./sq.yd. S.Y.		.61
10.80-oz./sq.yd. S.Y.		.65
8.9-oz./sq.yd. S.Y.		.67
40-inch, 2.56, 35x25		.25
60-inch, 1.71, 35x25		.435

* Net 10 days.
† 2% 10 days.

Scrap Rubber

Little or no change was noted in the scrap rubber market during the first half of the November 16-December 15 period, with prices holding at previously quoted levels. There was a fairly regular movement of material to consumers, but the quantities involved were not too large, trade factors noted.

Trading was quieter during the second half of the period under review. Some quarters indicated preholiday influences already were at work and that activity would lessen further as the holiday season came closer. At the same time, reclaimers appeared to be limiting their buying in preparation for the usual inventory-taking at the year-end.

	Eastern Points Per Net Ton	Akron, O. Per Net Ton
Mixed auto tires	$7.00	$12.50
S.A.G. truck tires	nom.	17.00
Peeling, No. 1	nom.	26.00
2	nom.	22.00
3	nom.	19.00
Tire buffings	nom.	nom.
	(¢ per Lb.)	
Auto tubes, mixed	4.00	4.00
Black	5.75	5.75
Red	6.25	6.25
Butyl	5.50	5.50

Rayon and Nylon

Production of tire cord and tire fabric during the third quarter, 1959, was 119,748 thousand pounds, according to the Bureau of Census. This was 2% above the previous-quarter output and 26% above the third-quarter 1958 level.

Output totaled 119.7 million pounds, including 76.6 million rayon, 30.6 million nylon, and 9.2 million cotton. Although production of rayon and nylon tire cord and tire fabric in the third quarter was sharply ahead of that of a year earlier, the rayon division showed less than 1% gain over the second-quarter output; while nylon producers scored an 8% gain.

Rayon tire cord — in an improved high strength form—is used in tires of most new cars. But nylon has made a strong bid for this market, according to tire makers, through a substantial price reduction last summer. Cotton cord and fabrics, once dominant in the tire market, lost their lead to the synthetics in the early 1950's.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., again cut prices on its nylon tire cord, effective December 23. The reductions range from 4.5% a pound to 8.5%. Chemstrand Corp., New York, N. Y., quickly followed suit.

The latest reductions — the second round in five months — promise a fiercer battle between rayon and nylon for the original-equipment tire market.

The new prices of Du Pont and Chemstrand on 840 denier and 1680 denier yarn are 97¢ a pound. The 840 denier yarn, used chiefly in passenger tires, was cut 9¢ a pound from $1.06. The 1680 denier, that goes into truck tires, was cut 6¢ a pound from $1.03.

Nylon makers say it takes 1.7 pounds of rayon to match a pound of nylon in tire cord making. As a result, they say, nylon is now competitive with

(*Continued on page 582*)

Synthetic Rubbers and Latices*

Monomers

11-80, 100, 200, 112-3 Triols	lb.	$0.255		
11-300	lb.	.265		
-400	lb.	.325		
Acrylonitrile	lb.	.27		
Butadiene	lb.	.15		
Dow Styrene	lb.	.12		
H99, N99	lb.	.205		
RG	lb.	.17		
Vinyltoluene	lb.	.17		
EGD	lb.	1.75	/	$2.00
Hylene M	lb.	1.25	/	2.75
M-50	lb.	.86	/	2.36
T	lb.	.90	/	2.46
TM	lb.	.75	/	2.31
-65	lb.	.80	/	2.36
Isobutylene	gal.	.38		
Isoprene	lb.	.25		
Mondur-C	lb.	1.05		
Multron R-2	lb.	.54		
P200	lb.	.23		
Rohm & Haas ethyl acrylate	lb.	.34	/	.36
Glacial methacrylic acid	lb.	.40	/	.425
Methyl acrylate	lb.	.37	/	.39
Methacrylate	lb.	.29	/	.31

Shortstops

4P Mercaptan	lb.	.27	/	.31
DDM	lb.	.94	/	.975
Mercaptan 174	lb.	.38	/	.50
Sharstop 204	lb.	.38	/	.42
268	lb.	.52	/	.53
Tecquinol	lb.	.825	/	.845
Thiostop K	lb.	.50	/	.53
N	lb.	.38	/	.47
Vulnapol KM	lb.	.52	/	.56
NM	lb.	.38	/	.42
Wingstop B	lb.	.38		

Acrylic Types

Acrylon BA-15	lb.	1.25[a]		
EA-5	lb.	1.00[a]		
Hycar 4021	1.34[e]	/	1.35[e]	

Latices

Hycar 2600X30, 2600X39, 2601	lb.	.50	/	.56

Butadiene Types (BR†)

Cis-1	lb.	.35[b]	/	.50[b]

Cold BR Latex

Pliolite Latex 2104	.325

Fluorocarbon Types

Kel-F Elastomer	lb.	15.00	/	16.00
5500, 820 (Latex)	lb.	15.00	/	17.15
Viton A, AHV	lb.	10.00		
B	lb.	13.00		

Isobutylene Types

Enjay Butyl 035, 065, 150, 215, 217, 218				.23[a]
165, 268, 325, 365				.24[a]
Hycar 2202		.65[e]	/	.75[e]
Polysar Butyl 100, 200, 300 400				.245[e]
101				.2775[a]
301				.255[e]
Vistanex LM				.45[a]
MM				.35[a]

Neoprene Types (CR)

Neoprene Type AC, AD, CG	.55[a]	/	.575[a]	
FB	.65[a]	/	.675[a]	
GN, GN-A, WX	.41[a]	/	.435[a]	
GRT, S	.42[a]	/	.445[a]	
KNR	.75[a]	/	.775[a]	
W, WHV	.39[a]	/	.415[a]	
WRT	.45[a]	/	.475[a]	

Latices

Neoprene Latex 571, 842-A	.37[a]	/	.47[a]	
572	.39[a]	/	.49[a]	
60, 601-A	.40[a]	/	.50[a]	
635	.41[a]	/	.51[a]	
650	.42[a]	/	.52[a]	
735, 736	.38[a]	/	.48[a]	
750	.39[a]	/	.49[a]	
950	.47[a]	/	.57[a]	

Nitrile Types

Butaprene NF				.49[b]
NH				.65[b]
NL				.50[b]
NXM				.58[b]
Chemigum, N1NS				.64[b]
N3NS, N5				.58[b]
N6, N-6B, N7, N8				.50[b]
N600				.50[b]

Hycar 1001, 1041	$0.58[e]	/	$0.59[a]	
1002, 1042, 1043, 1052, 1053, 1312	.50[e]	/	.51[e]	
1014	.60[e]	/	.61[e]	
1072	.64[e]	/	.65[e]	
1411	.62[e]	/	.63[e]	
1432, 1441	.59[e]	/	.60[e]	
Paracril, AJ	.485[e]	/	.495[a]	
B, BJ, BJLT, BLT	.50[e]	/	.51[e]	
C, CLT	.58[e]	/	.59[e]	
CV	.59[e]	/	.60[e]	
D	.65[e]	/	.66[e]	
OZO	.46[e]	/	.47[e]	
18-80	.60[e]	/	.61[e]	
Polysar Krynac 800, 802, 803				.50[e]
801				.58[e]

Latices

Butaprene N-300				.46[b]
N-400, N-401				.54[b]
Chemigum 200				.49[b]
235 CHS, 236				.54[b]
245 B, 245 CHS, 246, 247, 248				.46[b]
Hycar 1512, 1552, 1562, 1577	.45[e]	/	.52[e]	
1551, 1561, 1571	.53[e]	/	.60[e]	
1852	.46[e]	/	.52[e]	
Nitrex 2612	.45[a]	/	.52[a]	
2616	.53[a]	/	.60[a]	
2619	.52[a]	/	.59[a]	
2620, 2625	.45[a]	/	.52[a]	
Tylac 640	.45[e]	/	.52[e]	
740	.49[e]	/	.56[e]	
840	.53[e]	/	.60[e]	
1640	.54[e]	/	.61[e]	

Polyethylene Type

Hypalon 20, 30	lb.	.70	/	.7275

Polysulfide Types

Thiokol LP-2, -3, -31, -32, -33				.96[a]
-8				1.35[a]
-205				4.00[a]
Type-A				.50[a]
FA				.69[a]
ST				1.25[a]

Latices

Thiokol Latex (dry wt.) Type MX				.80[a]
WD-2				1.25[a]
-6		.80[a]	/	1.25[a]

Silicone Types

GE (compounded)	2.29[e]	/	4.90[e]	
Silicone gum (not compounded)	3.85[e]	/	4.55[e]	
Silastic (compounded)	2.95[b]	/	3.50[b]	
(Partly compounded)	3.15[b]	/	3.60[b]	
(Uncompounded)	4.05[b]	/	4.35[b]	
LS-53	16.00	/	22.00	
Union Carbide (compounds)	2.35[b]	/	3.20[b]	
(Gums)	3.85[b]	/	4.25[b]	

Styrene Types

Hot SBR‡

Ameripol 1000, 1001, 1006, 1007	.24[e]	/	.247[e]	
1002	.2435[e]	/	.2495[e]	
1006 Crumb	.2475[e]	/	.2535[e]	
1009	.2475[e]	/	.2535[e]	
Crumb	.259[e]	/	.265[e]	
1011	.2475[e]	/	.2535[e]	
1012	.2425[e]	/	.2485[e]	
Crumb	.249[e]	/	.255[e]	
1013	.241[e]	/	.247[e]	
Crumb	.2615[e]	/	.2675[e]	
ASRC 1004, 1006	.241[e]	/	.2475[e]	
1009	.2475[e]	/	.2535[e]	
1018	.27[e]	/	.276[e]	
1019	.265[e]	/	.271[e]	
Copo 1006	.241[e]	/	.247[e]	
FR-S 1000, 1001, 1004, 1006	.241[e]	/	.247[e]	
1007	.241[e]	/	.247[e]	
1009	.2475[e]	/	.2535[e]	
1010	.26[e]	/	.266[e]	
1012	.2425[e]	/	.2485[e]	
1013	.241[e]	/	.247[e]	
Crumb	.2615[e]	/	.2675[e]	
1014	.281[e]	/	.287[e]	
141	.28[e]	/	.286[e]	
181	.241[e]	/	.247[e]	
Naugapol 1016, 1019	.265[b]	/	.27[b]	
1018	.27[b]	/	.275[b]	
1021	.30[b]	/	.305[b]	
1022	.295[b]	/	.30[b]	
1023	.315[b]	/	.32[b]	
6003	.27[b]	/	.275[b]	
Philprene 1000, 1001, 1006, 6701	.241[b]	/	.247[b]	
1009	.2475[b]	/	.2535[b]	
1018	.27[b]	/	.276[b]	
1019	.265[b]	/	.271[b]	
Plioflex 1006	.241[e]	/	.247[e]	
Polysar S-630	.241[e]	/	.247[a]	
S-X-371	.255[e]	/	.261[e]	
S-1000, -1006, -1013			.23[a]	
-1002, -1011			.2325[a]	
-1009			.24[a]	
Synpol 1000, 1001, 1006, 1007, 1061	.241[b]	/	.247[bb]	
1002	.2435[b]	/	.2495[b]	
1012	.2425[b]	/	.2485[b]	
1009	.2475[b]	/	.2535	
8000	.241[b]	/	.247[b]	
X-274	.255[e]	/	.261[e]	

Hot SBR Black Masterbatch

Philprene 1100				$0.194
1104				.190[e]
S-1100				.185[a]

Hot SBR Latices

FR-S 2000, 2001	$0.2725[e]	/	.3425[e]	
2002	.35[e]	/	.36[e]	
2003, 2004	.305[e]	/	.36[e]	
2006	.29[e]	/	.382[e]	
Naugatex 2000, 2001	.2775[e]	/	.3575[a]	
2002	.30[a]	/	.37[a]	
2006	.29[a]	/	.42[a]	
Pliolite Latex 2000, 2001			.2825	
2076			.295[e]	
Polysar Latex II			.29[a]	
IV			.2775	
S-2000, 2006			.26[a]	

Cold SBR

Ameripol 1500, 1501, 1502, 4600	.241[e]	/	.247[e]	
ASRC 1500, 1502	.241[e]	/	.247[e]	
1503	.2625[e]	/	.2685[e]	
3105, 3106	.241[e]	/	.247[e]	
3110	.26[e]	/	.266[e]	
C-102			.23[a]	
Copo 1500, 1502	.241[e]	/	.247[e]	
1505	.261[e]	/	.267[e]	
FR-S 1500, 1502, 146, 179	.241[e]	/	.247[e]	
127	.26[e]	/	.266[e]	
Gentro 1500			.241	
Naugapol 1503	.2625[b]	/	.2675[b]	
1504	.33[b]	/	.335[b]	
6100	.31[b]	/	.315[b]	
Philprene 1500, 1502	.241[b]	/	.247[b]	
1503	.2625[b]	/	.2685[b]	
Plioflex 1500C, 1502, 1507, 1508X	.241[e]	/	.247[e]	
Polysar Kryflex 200			.251[e]	
252			.27[e]	
Krylene NS			.241[a]	
SS-250, SS-250-Flake			.2875[e]	
S-1500, S-1502			.23[a]	
1509			.23[a]	
Synpol 1500, 1502, 1551	.241[b]	/	.247[b]	

Cold SBR Black Masterbatch

Ameripol 4650	.182[e]	/	.188[e]	
4651	.177[e]	/	.183[e]	
4652	.1425[e]	/	.1485[e]	
4654	.187[e]	/	.193[e]	
4655	.182[e]	/	.188[e]	
Baytown 1600, 1601, 1602			.193[b]	
CB-102			.185[a]	
Gentro-Jet 9152			.208	
9153			.182	
9154			.1845	
Philprene 1601	.193[b]	/	.199[b]	
1603	.194[b]	/	.200[a]	
1605	.19[b]	/	.196[b]	
S-1600, -1602			.1825[a]	
-1605			.18[a]	
Synpol 8150	.193[b]	/	.199[b]	
8151	.182[b]	/	.186[b]	

Cold SBR Oil Masterbatch

Ameripol 1705	.2035[e]	/	.2095[e]	
1707, 1708	.191[e]	/	.197[e]	
1710, 1712	.1885[e]	/	.1945[e]	
4700	.175[e]	/	.181[e]	
4701	.1725[e]	/	.1785[e]	
ASCR 1703	.206[e]	/	.212[e]	
1708	.191[e]	/	.197[e]	
1712	.1885[e]	/	.1945[e]	
1713	.175[e]	/	.181[e]	
Carbomix 3750	.182[e]	/	.188[e]	
3752	.1845[e]	/	.1905[e]	
3754	.177[e]	/	.183[e]	
Copo 1712	.1885[e]	/	.1945[e]	
1773	.206[e]	/	.212[e]	
1778	.191[e]	/	.197[e]	
3900	.231[e]	/	.237[e]	
FR-S 1703	.206[e]	/	.212[e]	
1710	.1885[e]	/	.1945[e]	
1712	.1885[e]	/	.1945[e]	
123	.196[e]	/	.202[e]	
154, 155	.1885[e]	/	.1945[e]	
173	.206[e]	/	.212[e]	
178	.191[e]	/	.197[e]	
Gentro 1712			.1885	
Philprene 1703	.206[b]	/	.212[b]	
1708	.191[b]	/	.197[b]	
1712	.1885[b]	/	.1945[b]	
Plioflex 1703, 1773	.206[e]	/	.212[e]	
1710C, 1712C	.1885[e]	/	.1945[e]	
1713	.175[e]	/	.181[e]	
1714C	.1725[e]	/	.1785[e]	
1773	.206[e]	/	.212[e]	
1778	.191[e]	/	.197[e]	
Polysar Krynol 651			.1885[e]	
652			.191[e]	
S-1703			.195[a]	
-1707			.18[a]	
-1709, -1712			.1775[a]	
-7701			.185[a]	
Synpol 1703	.206[b]	/	.212[b]	
1707, 1708	.191[b]	/	.197[b]	
1711	.19[b]	/	.196[b]	
1712	.1885[b]	/	.1945[b]	
8200	.191[b]	/	.197[b]	
8201	.175[b]	/	.181[b]	
8202	lb. .1725[b]	/	.1785[b]	

(Continued on page 582)

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[a] Freight extra.
[b] Minimum freight allowed.
[e] Freight prepaid.
* Prices are per pound carload of tank-car dry weight unless otherwise specified.
† BR—Butadiene rubber.
‡ SBR—Styrene-butadiene rubber.

RC

for low temperature Elastomers

PLASTICIZERS

* **RC Plasticizer TG-8**
  (Triethylene Glycol Dicaprylate)
* **RC Plasticizer TG-85**
  (Triethylene Glycol Caprate-Caprylate)
* **RC Plasticizer TG-9**
  (Triethylene Glycol Dipelargonate)
* **RC Plasticizer DOA**
  (Dioctyl Adipate)
* **RC Plasticizer DOS**
  (Dioctyl Sebacate)
* **RC Plasticizer DBP**
  (Dibutyl Phthalate)
* **RC Butyl Oleate**

For use in GR-S, Neoprene, Buna N and natural rubber compounds to reduce nerve and produce superior flex and smooth extrusions. Write for samples!

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Claremont has served the rubber industry for over thirty years as a supplier of quality flocks produced to fit specific requirements. Whether used inside or outside, as a filler or as a finish, the superiority of Claremont Cotton Flocks is recognized by all users.

Used as a compounding agent in the manufacture of mechanical rubber goods and general sundries, Claremont Flock Fillers provide reinforcement, improve tear and abrasion resistance. Claremont flock finishes for rubber fabrics provide a wide range of appealing textures that are uniform and long-wearing. In many applications the proper use of a Claremont flock will substantially reduce production costs.

Claremont's knowledge of the industry's needs and its capacity for large production and quick delivery have made it the country's foremost producer of cotton flocks. Samples will be furnished upon request for laboratory and test runs. Inquiries invited!

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CLAREMONT, NEW HAMPSHIRE

The Country's Largest Manufacturer of Flock

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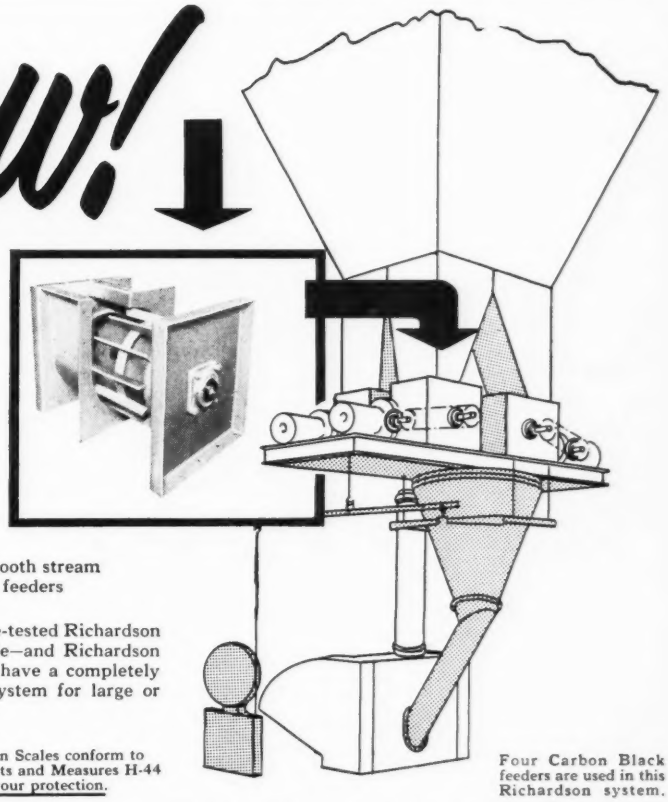
Specialized Carbon Black Feeder Increases Weighing Accuracy for Better End Products

Richardson's latest contribution to the production of improved rubber products, at lower manufacturing costs, is this new-type Feeder that eliminates pulsations in delivery of carbon black to the scale. Located in-line with storage bin and scale, it . . .

- delivers at a rate of up to 20 cu. ft. per minute in smooth stream
- provides vastly improved accuracy over other rotary feeders
- allows maximum space economy

Add to this important new development the performance-tested Richardson Carbon Black automatic scale—the most accurate made—and Richardson automatic controls and recording equipment, and you have a completely automatic, efficient, *low cost* carbon black handling system for large or small rubber plants. Write today for full information.



Four Carbon Black feeders are used in this Richardson system.

Richardson Scales conform to U. S. Weights and Measures H-44 for your protection.

Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY
Sales and Service Branches in Principal Cities
Also manufactured in Europe to U.S. standards

Compounding Ingredients*

Abrasives

Pumicestone, powdered	lb.	$0.0363/	$0.065
Rottenstone, domestic	lb.	.03 /	.04
Shelblast	ton	80.00 /	165.00
Walnut Shell Grits	ton	50.00 /	160.00

Accelerators

A-1 (Thiocarbanilide)	ton	.50 /	.57
A-32	ton	.66 /	.80
A-100	lb.	.52 /	.66
Accelerator 49	lb.	.59 /	.60
52	lb.	1.14	
57, 62, 67, 77	lb.	1.04	
66	lb.	4.25	
89	lb.	1.20	
108	lb.	.92	
552	lb.	2.25	
808	lb.	.66 /	.68
833	lb.	1.17 /	1.19
Altax	lb.	.54 /	.56
Amax	lb.	.75 /	.77
No. 1	lb.	.71 /	.73
Arazate	lb.	2.25	
Beutene	lb.	.66 /	.68
Bismate	lb.	3.00	
B-J-F	lb.	.27 /	.32
Butasan	lb.	1.04	
Butazate	lb.	1.04	
Butyl Eight	lb.	1.10 /	1.35
Namate	lb.	.45 /	.50
Zimate	lb.	1.04	
Ziram	lb.	.89 /	1.04
Captax	lb.	.44 /	.46
Conac S	lb.	.76 /	.78
C-P-B	lb.	1.95	
Cumate	lb.	1.45	
Cydac	lb.	.70 /	.73
Cyuram DS, powder	lb.	1.14	
Pellets	lb.	1.14	
MS, powder	lb.	1.14	
Pellets	lb.	1.14	
Cyzate B, E	lb.	.85 /	.89
Delac-S	lb.	.71 /	.73
Dibs	lb.	.85	
Dipac	lb.	.85	
DOTG (diorthotolylguanidine)			
Cyanamid	lb.	.69 /	.70
Du Pont	lb.	.69 /	.70
DPG (diphenylguanidine)			
Cyanamid	lb.	.49 /	.50
Monsanto	lb.	.52 /	.58
El-Sixty	lb.	.62 /	.64
Ethasan	lb.	1.04	
Ethazate	lb.	1.04	
50-D	lb.	.87 /	.89
Ethyl Seleram	lb.	3.00	
Thiurad	lb.	1.04	
Thiuram	lb.	1.04	
Tuads	lb.	1.04	
Tuex	lb.	1.04	
Zimate	lb.	1.04	
Ziram	lb.	.89 /	1.04
Ethylac #650	lb.	.93 /	.95
Guantal	lb.	.60 /	.67
Hepteen Base	lb.	1.85	
Ledate	lb.	1.04	
MBT (2-mercaptobenzothiazole)			
American Cyanamid	lb.	.44 /	.46
Du Pont	lb.	.44 /	.46
Naugatuck	lb.	.44 /	.49
-XXX, Cyanamid	lb.	.55 /	.57
MBTS (mercaptobenzothiazyl disulfide)			
Cyanamid	lb.	.54 /	.56
Du Pont	lb.	.54 /	.56
Naugatuck	lb.	.54 /	.56
-W Cyanamid	lb.	.59 /	.61
Merac #225	lb.	.75 /	1.05
Mertax	lb.	.55 /	.57
Methasan	lb.	1.04	
Methazate	lb.	1.04	
Methyl Thiuram	lb.	1.14	
Tuads	lb.	1.14	
Zimate	lb.	1.04	
Monex	lb.	1.14	
Mono-Thiurad	lb.	1.14	
2-MT (2-mercaptothiazoline)			
Cyanamid	lb.	.88 /	.90
Du Pont	lb.	1.00	
NA-22	lb.	1.05	
NOBS No. 1	lb.	.70 /	.78
Special	lb.	.74 /	.82
O-X-A-F	lb.	.55 /	.57
Pennac SDB	lb.	.45 /	.48
Pentex	lb.	1.24	
Flour	lb.	.30	
Permalux	lb.	2.25	
Phenex	lb.	.52 /	.59
Pip-Pip		2.07	
Polyac Pellets	lb.	1.85	
R-2 Crystals	lb.	4.35	
Rotax	lb.	.55 /	.57
RZ-50, -50B	lb.	1.00	
S.A. 52	lb.	1.14	
57, 62, 67, 77	lb.	1.04	
66	lb.	3.00	
Santocure	lb.	.71 /	.73
NS	lb.	.71 /	.73
Selenacs	lb.	3.00	
SPDX-GH	lb.	.69 /	.74
GL	lb.	1.20 /	1.34
Sulfads	lb.	1.98	
Tellurac	lb.	1.30 /	1.55
Tepidone	lb.	$0.45	
Tetrone A	lb.	1.98	
Thiates	lb.	.88 /	$1.25
Thiofide	lb.	.54 /	.56
S	lb.	.64 /	.66
Thionex	lb.	1.14	
Thiotax	lb.	.44 /	.46
Thiurad	lb.	1.14	
Thiuram E	lb.	1.04	
M	lb.	1.14	
Trimene	lb.	.56 /	.58
Base	lb.	1.03 /	1.06
Tuex	lb.	1.14	
Ultex	lb.	1.00 /	1.10
Unads	lb.	1.14	
Ureka Base	lb.	.66 /	.73
Vulcacure NB	lb.	.45	
NS	lb.	.75 /	1.05
T.M.D.	lb.	1.14	
ZB, ZE, ZM	lb.	.85 /	.89
Z-B-X	lb.	2.45	
Zenite	lb.	.54 /	.56
A	lb.	.69 /	.71
AM	lb.	.76 /	.78
Special	lb.	.55 /	.57
Zetax	lb.	.55 /	.57
Zimate	lb.	1.04	
ZMBT	lb.	.55 /	.57

Accelerator-Activators, Inorganic

Lime, hydrated	ton	21.96	
Litharge, comml.	lb.	.1425/	.1575
Eagle, sublimed	lb.	.1535	
National Lead, sublimed	lb.	.1585	
Red lead, comml.	lb.	.185 /	.195
Eagle	lb.	.1575	
National Lead	lb.	.1625/	.1645
PRD-90	lb.	.38 /	.50
White lead, carbonate	lb.	.19 /	.20
Eagle	lb.	.17 /	.18
National Lead	lb.	.18 /	.19
Silicate	lb.	.1725/	.1825
Eagle	lb.	.1475/	.22
National Lead	lb.	.165 /	.175
Zinc oxide, comml.†	lb.	.145 /	.155

Accelerator-Activators, Organic

Aktone	lb.	.2125/	.2325
Barak	lb.	.65	
Capital 170	lb.	.20 /	.25
171	lb.	.1425/	.1925
225, 258, 710	lb.	.14 /	.19
261	lb.	.155 /	.18
262	lb.	.16 /	.185
263	lb.	.1775/	.2025
270	lb.	.1175/	.1425
Curade	lb.	.57 /	.59
D-B-A	lb.	1.95	
Emery 600	lb.	.1425/	.1925
G-M-F	lb.	2.60 /	2.65
PDD-70	lb.	2.70 /	3.00
PGD-25	lb.	1.25 /	1.50
Groco 30	lb.	.1425/	.1925
Guantal	lb.	.62 /	.64
Hyfac 410	lb.	.1425/	.1675
430	lb.	.18 /	.205
431	lb.	.2025/	.2275
Hystrene S-97	lb.	.1863/	.2125
T-45	lb.	.1638/	.19
T-70	lb.	.1738/	.20
Industrene B	lb.	.1263/	.1525
R	lb.	.1138/	.14
158	lb.	.1313/	.1575
254	lb.	.1413/	.1675
262	lb.	.1513/	.1775
Laurex	lb.	.37 /	.39
MODX	lb.	.295 /	.345
NA-22	lb.	1.05	
PND-70	lb.	1.35 /	1.60
Oleic acid, comml.	lb.	.185 /	.225
Emersol 210 Elaine	lb.	.1425/	.1925
Groco 2, 4, 8, 18	lb.	.1425/	.1925
Welcoline	lb.	.21 /	.42
Plastone	lb.	.27 /	.30
Polyac	lb.	1.85	
Ridacto	lb.	.25 /	.26
Seedine	lb.	.1485/	.1703
Stearex Beads	lb.	.1488/	.1588
Stearic acid			
Emersol 120	lb.	.1575/	.1825
150	lb.	.185 /	.21
Hydrofoil 51	lb.	.09	
Hydrogenated, rubber grd.			
Groco 56	lb.	.1225/	.1475
Rufat 75	lb.	.1062/	.1325
Single pressed, comml.	lb.	.1475/	.1675
Emersol 110	lb.	.1525/	.1775
Groco 53	lb.	.1575/	.1825
Wilmar 253	lb.	.1525/	.1775
Double pressed, comml.	lb.	.1525/	.1725
Groco 54	lb.	.1625/	.1875
Wilmar 254	lb.	.1575/	.1825
Triple pressed, comml.	lb.	.175 /	.195
Groco 55	lb.	.18 /	.205
Wilmar 255	lb.	.1875/	.2075
Sterene 60-R	lb.	.09 /	.1075
Tonox	lb.	.54 /	.56
Vimbra	lb.	.32 /	.385
Vulklor	lb.	.88 /	.98
Wilmar 110	lb.	.17 /	.22
434	lb.	.1425/	.1925
Zinc stearate, comml.	lb.	.39 /	.44

Antioxidants

AgeRite Alba	lb.	$2.40 /	$2.50
Gel	lb.	.70 /	.72
H. P.	lb.	.79 /	.80
Hipar	lb.	1.05 /	1.07
Powder	lb.	.57 /	.59
Resin	lb.	.88 /	.90
D	lb.	.57 /	.59
Spar	lb.	.57 /	.59
Stalite	lb.	.57 /	.59
S	lb.	.57 /	.59
Superlite	lb.	.57 /	.59
White	lb.	1.50 /	1.60
Akroflex C	lb.	.85 /	.87
CD	lb.	.79 /	.81
Albasan	lb.	.69 /	.73
Alcogard 354 Powder	lb.	1.50 /	1.52
Allied AA 1144	lb.	.23 /	.24
AA-1177	lb.	.155 /	.165
Aminox	lb.	.57 /	.59
Antioxidant 425	lb.	2.47 /	2.50
2246	lb.	1.50 /	1.53
Antisol	lb.	.23 /	.24
Antisun	lb.	.15 /	.51
Antox	lb.	.59 /	.61
Aranox	lb.	3.25	
Betanox Special	lb.	.94 /	.96
B-L-E, -25	lb.	.57 /	.59
Burgess Antisun Wax	lb.	.185	
B-X-A	lb.	.55 /	.60
CAO-1	lb.	.37 /	.86
-5	lb.	1.49 /	1.63
Copper Inhibiter X-872-L	lb.	2.01	
D-B-P-C	lb.	.91 /	1.16
Deenax	lb.	.95	
Flectol H	lb.	.57 /	.59
Flexamine	lb.	.79 /	.81
Heliozone	lb.	.31 /	.32
Ionol	lb.	.91 /	1.65
Microflake	lb.	.20 /	.24
Naugawhite	lb.	.57 /	.59
NBC	lb.	1.67	
Neozone A	lb.	.64 /	.66
C	lb.	.86 /	.88
D, Special	lb.	.57 /	.59
Nevastain A	lb.	.51 /	.61
B	lb.	.51 /	.70
Nonox CI	lb.	1.50 /	1.67
WSL	lb.	1.50 /	1.60
WSP	lb.	1.47 /	1.60
Octamine	lb.	.57 /	.59
PDA-10	lb.	.46 /	.48
Pennox A, C, D	lb.	.57 /	.59
B	lb.	.67 /	.69
Perflectol	lb.	.61 /	.68
Permalux	lb.	2.25	
Polygard	lb.	.57 /	.59
Polylite	lb.	.55 /	.60
Protector	lb.	.26 /	.31
Rio Resin	lb.	.70 /	.72
Santoflex 35	lb.	.72 /	.79
75	lb.	1.01 /	1.03
AW	lb.	.71 /	.78
B	lb.	.52 /	.59
BX	lb.	.63 /	.70
DD	lb.	.57 /	.59
Santovar A	lb.	1.55 /	1.57
Santowhite Crystals, Powder	lb.	1.55 /	1.62
L	lb.	.57 /	.59
MK	lb.	1.25 /	1.32
Stabilite	lb.	.55 /	.59
Alba	lb.	.72 /	.79
L	lb.	.60 /	.64
White	lb.	.52 /	.60
Powder	lb.	.41 /	.47
Styphen I	lb.	.51 /	.55
Sunolite #100	lb.	.21 /	.23
#127	lb.	.17 /	.19
Sunproof-713	lb.	.26 /	.27
Improved	lb.	.25 /	.26
Jr.	lb.	.22 /	.23
Tenamene 3	lb.	.91 /	1.05
Thermoflex A	lb.	1.05 /	1.07
Tonox	lb.	.54 /	.59
Velvapex 51-250	lb.	.40	
V-G-B	lb.	.75 /	.80
Zalba	lb.	1.10	
Zenite	lb.	.52 /	.54

Antiozonants

Eastozone 30, 31	lb.	1.05 /	1.09
32	lb.	1.15 /	1.20
Flexone 3-C	lb.	2.00	
6-H	lb.	1.25 /	1.27
Nonox ZA	lb.	1.99 /	2.00
Tenamene 30, 31	lb.	1.24 /	1.28
Tysonite	lb.	.30 /	.3075
UOP 88, 288	lb.	1.05 /	1.07
Wing-Stay S, T	lb.	.55 /	.67
100	lb.	1.00 /	1.08

Antiseptics

Copper naphthenate, 6-8%	lb.	.245	
Pentachlorophenol	lb.	.22 /	.30
Resorcinol, technical	lb.	.775 /	.785
Zinc naphthenate, 8-10%	lb.	.245 /	.30

Blowing Agents

Ammonium bicarbonate	lb.	.07 /	.09
Carbonate	lb.	.16	

* Prices, in general, are f.o.b. works. Range indicates grade or quantity variations. No guarantee of these prices is made. Spot prices should be obtained from individual suppliers.

† For trade names, see Color—White, Zinc Oxides.

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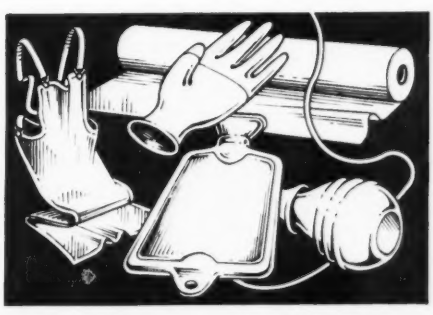


Factice
THE STAMFORD RUBBER SUPPLY CO.
Vulcanized Oil

THE STAMFORD RUBBER SUPPLY CO., STAMFORD, CONN.

Blowing Agent 81105	lb.	$0.32 /	$0.35
Celogen	lb.	1.95	
-80	lb.	1.60	
-AZ	lb.	1.92	
Kempore R-125	lb.	1.92	
Opex 40	lb.	.72	
PL-80	lb.	1.44	
Sodium bicarbonate	100 lbs.	2.55 /	3.85
Carbonate, tech.	100 lbs.	1.35 /	5.52
Sponge Paste	lb.	.20	
Unicel ND	lb.	.72	
NDX	lb.	1.44	
S	lb.	.20	
Vulcacel BN	lb.	1.36 /	1.51
BMC	lb.	.68 /	.79

Bonding Agents

Braze	gal.	6.00 /	9.00
Cover cement	gal.	2.50 /	4.00
Chemlok 201, 203	gal.	5.00 /	7.50
220	gal.	9.25 /	12.00
401	gal.	11.70 /	14.40
602	gal.	25.00 /	26.00
607	gal.	18.00	
614	lb.	4.35 /	4.75
Flocking Adhesive RFA17, RFA22, RFA25	lb.	.50	
G-E Silicone Paste SS-15	lb.	4.52 /	5.10
SS-64	lb.	3.65 /	6.75
-67 Primer	lb.	7.50 /	12.50
Gen-Tac Latex	lb.	.70 /	.805
Hylene M	gal.	3.50 /	3.75
M-50	gal.	1.90 /	2.15
Kalabond Adhesive	gal.	6.50 /	16.00
Tie Cement	gal.	2.00 /	5.60
Thixons	gal.	1.48 /	12.00
Ty Ply, BN, Q, S, UP, 3640	gal.	6.75 /	8.00
BC	lb.	4.50 /	6.00
RC	gal.	3.75 /	5.00

Brake Lining Saturants

BRT 3	lb.	.018 /	.0265
Resinex L-S	lb.	.0225/	.03

Carbon Blacks‡

Conductive Channel—CC

Continental R-40	lb.	.26 /	.35
Kosmos/Dixie BB	lb.	.23 /	.30
Texas MC-74-BD	lb.	.26 /	.35
Voltex	lb.	.18 /	.315

Easy Processing Channel—EPC

Collocarb EPC	lb.	.059 /	.099
Continental AA	lb.	.0775/	.155
Kosmobile 77/Dixiedensed 77	lb.	.074 /	.1225
Micronex W-6	lb.	.0725/	.155
Spheron #9	lb.	.0775/	.155
Texas E	lb.	.08 /	.1625
Witco #12	lb.	.0775/	.155
Wyex EPC	lb.	.0725/	.155

Hard Processing Channel—HPC

HX HPC	lb.	.074 /	.1225
Kosmobile S/Dixiedensed S	lb.	.074 /	.1225
Micronex Mk. II	lb.	.0775/	.145
Witco #6	lb.	.074 /	.1225

Medium Processing Channel—MPC

Arrow MPC	lb.	.0725/	.155
Continental A	lb.	.0775/	.155
Kosmobile S-66/Dixiedensed S-66	lb.	.0775/	.145
Micronex Standard	lb.	.0725/	.155
Spheron #6	lb.	.0775/	.155
Texas M	lb.	.08 /	.1625
Witco #1	lb.	.0775/	.155

Conductive Furnace—CF

Aromex CF	lb.	.0875/	.155
Continex CF	lb.	.11 /	.17
Vulcan C	lb.	.110 /	.185
SC	lb.	.18 /	.255
XC-72	lb.	.25 /	.34

Fast Extruding Furnace—FEF

Arovel FEF	lb.	.0625/	.135
Continex FEF	lb.	.0675/	.135
Kosmos 50/Dixie 50	lb.	.06 /	.10
Philblack A	lb.	.0675/	.135
Statex M	lb.	.0625/	.135
Sterling SO	lb.	.0675/	.135

Fine Furnace—FF

Statex B	lb.	.0675/	.14
Sterling 99	lb.	.0725/	.14

High Abrasion Furnace—HAF

Aromex HAF	lb.	.0725/	.145
Continex HAF	lb.	.0775/	.145
Kosmos 60/Dixie 60	lb.	.079 /	.1175
Philblack O	lb.	.0775/	.145
Statex R	lb.	.0725/	.145
Vulcan #3	lb.	.0775/	.145

Intermediate Super Abrasion Furnace—ISAF

Aromex ISAF	lb.	.0875/	.16
Continex ISAF	lb.	.0925/	.16
Kosmos 70/Dixie 70	lb.	.10 /	.045
Philblack I	lb.	.0925/	.16
Statex 125	lb.	.0875/	.16
Vulcan 6	lb.	.0925/	.16

General-Purpose Furnace—GPF

Arogen GPF	lb.	$0.055 /	$0.1275
Continex GPF	lb.	.06 /	.1275
Statex G	lb.	.055 /	.1275
Sterling V	lb.	.06 /	.1275
Non-staining	lb.	.06 /	.1275

High Modulus Furnace—HMF

Collocarb HMF	lb.	.045 /	.085
Continex HMF	lb.	.0625/	.13
Kosmos 40/Dixie 40	lb.	.055 /	.095
Modulex HMF	lb.	.0575/	.13
Statex 93	lb.	.0575/	.13
Sterling L, LL	lb.	.0625/	.13

Semi-Reinforcing Furnace—SRF

Collocarb SRF	lb.	.042 /	.082
Continex SRF	lb.	.0575/	.125
Essex SRF	lb.	.0525/	.125
Furnex	lb.	.0525/	.125
Gastex	lb.	.0625/	.135
Kosmos 20/Dixie 20	lb.	.0575/	.0775
Pelletex, NS	lb.	.0575/	.125
Sterling NS, S	lb.	.0575/	.125
R	lb.	.0625/	.135

Super Abrasion Furnace—SAF

Philblack E	lb.	.115 /	.19
Statex 160	lb.	.11 /	.19
Vulcan 9	lb.	.115 /	.19

Fine Thermal—FT

P-33	lb.	.0575/	.1025
Sterling FT	lb.	.0575	

Medium Thermal—MT

Sterling MT	lb.	.04	
Non-staining	lb.	.05	
Thermax	lb.	.04 /	.085
Stainless	lb.	.05 /	.095

Colors

Black

Iron oxides, comml.	lb.	.1235/	.135
BK—Lansco	lb.	.1275/	.13
Williams	lb.	.145	
Lansco synthetic	lb.	.10	
Mapico pure synthetic	lb.	.1475/	.15
Lampblack, comml.	lb.	.16 /	.45
Superjet	lb.	.085 /	.12
Permanent Blue	lb.	.80 /	1.05
Stan-Tone	lb.	.45 /	1.20
Vansul masterbatch	lb.	.60 /	.65
Paste	lb.	.14 /	.15

Blue

Alkali Blue G, R	lb.	2.38	
C. P. Iran Blues	lb.	.52 /	.54
Du Pont	lb.	2.55 /	4.75
Filo	lb.	.28	
Heveatex pastes	lb.	.80 /	1.45
Lansco ultramarines	lb.	.25 /	.28
Monsanto Blue 7	lb.	1.55	
11	lb.	3.45	
DPB-283	lb.	1.93	
S-11	lb.	2.05	
Permanent Blue	lb.	.80 /	1.05
Solfast	lb.	1.60 /	3.25
Stan-Tone Violet Blue			
D-4000	lb.	3.45	
4001	lb.	3.00	
4002	lb.	.90	
4900	lb.	1.97 /	2.15
Vansul masterbatch	lb.	.90 /	2.70

Brown

Filo	lb.	.13	
Iron oxides, comml.	lb.	.1425/	.145
Lansco synthetic	lb.	.125	
Mapico Brown	lb.	.1575/	.16
Sienna, burnt, comml.	lb.	.0425/	.155
Williams	lb.	.115 /	.1775
Raw, comml.	lb.	.045 /	.1325
Williams	lb.	.08 /	.1725
Umber, burnt, comml.	lb.	.06 /	.07
Williams	lb.	.0725/	.085
Raw, comml.	lb.	.0625/	.07
Williams	lb.	.07 /	.0825
Williams, pure brown	lb.	.155	
Vandyke	lb.	.12	
Mapico Tan	lb.	.2325/	.235
Metallic brown pure synthetic	lb.	.05 /	.06
Vansul masterbatch	lb.	2.10 /	2.20

Green

Chrome	lb.	.42 /	.45
Green	lb.	.80 /	2.40
Oxide	lb.	.3925/	1.10
Cyanamid	lb.	.42 /	.44
Green G	lb.	3.00	
Lincoln Green	lb.	5.30 /	6.60
G-4099-6099	lb.	.4525	
GH-9869	lb.	1.10 /	1.25
9976	lb.	1.20 /	1.35
Du Pont	lb.	2.05 /	2.80
Filo	lb.	.40	
Heveatex pastes	lb.	.95 /	1.85
Lansco Toner	lb.	1.35	
Monsanto Green 3	lb.	2.75	
14	lb.	1.45	
17	lb.	3.95	
71205	lb.	1.35	
DGP	lb.	2.03	
S-17	lb.	2.25	

‡ At the request of the suppliers, the lowest prices shown for carbon blacks are for carloads in bags. Prices for hopper carloads are lower.

Permansa	lb.	$1.45	
Serene	lb.	3.50	
Solfast	lb.	1.60 /	$3.35
Stan-Tone			
D-5000	lb.	3.95	
5001	lb.	.82	
5400	lb.	1.45	
Vansul masterbatch	lb.	2.00 /	2.60

Orange

Benzidine 12193	lb.	3.30	
Cyanamid Permatons	lb.	1.50 /	1.56
Dianisidine 10406	lb.	2.85	
Du Pont	lb.	2.25	
Molybdate	lb.	.49	
Monsanto Orange 68187	lb.	2.90	
Stan-Tone			
Light orange 70 PCO3	lb.	2.48 /	2.76
D-7003	lb.	3.97 /	4.17
Orange 70 PCO4	lb.	2.80 /	3.08
D-7004	lb.	4.23 /	4.43
7104	lb.	1.85 /	2.05
Vansul masterbatch	lb.	2.00 /	2.60

Red

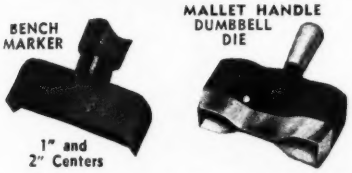
Antimony trisulfide	lb.	.285 /	.315
R. M. P. No. 3	lb.	.72	
Sulfur Free	lb.	.78	
Arcturus CP-1270	lb.	1.35	
Brilliant Toning Red	lb.	.77 /	1.90
Cadmium red lithopones	lb.	2.21 /	3.77
Cadmolith	lb.	1.72 /	2.20
Cyanamid	lb.	.93 /	1.90
Naphthol Red, Scarlet	lb.	2.95 /	3.80
Du Pont	lb.	2.00 /	2.05
Filo	lb.	.11	
Indian Red	lb.	.1275	
Iron oxide, comml.	lb.	.06 /	.13
Lansco synthetic	lb.	.1175	
Mapico pure synthetic	lb.	.1425/	.145
Recco	lb.	.12	
Williams Red	lb.	.13 /	.1525
Lake Red C, CP-1104	lb.	1.25	
Monsanto Maroon 113	lb.	1.50	
61148	lb.	1.75	
Red 7	lb.	1.55	
41	lb.	4.40	
3501	lb.	1.15	
4004	lb.	1.50	
69191	lb.	3.38	
Autumn	lb.	1.10	
PRP-285	lb.	1.27	
S-44	lb.	1.28	
Plasticone	lb.	1.02 /	4.60
Rub-Er-Red	lb.	.0975	
Solfast	lb.	1.60 /	1.80
Stan-Tone			
70 PCO5	lb.	3.00 /	3.28
D-2000	lb.	1.25	
2110, 2120, 2121	lb.	.98	
2200	lb.	1.47	
2500	lb.	1.90	
2600	lb.	4.60	
2601	lb.	1.60	
2700		1.75	
2800	lb.	1.90	
Light Red D-7005	lb.	4.68 /	4.88
7105	lb.	1.97 /	2.17
Red 70 PCO6	lb.	3.35 /	3.63
D-7006	lb.	4.89 /	5.09
D-7106	lb.	2.20 /	2.40
Vansul masterbatch	lb.	.95 /	3.30
Venetian	lb.	.04 /	.0675

White

Antimony oxide	lb.	.27 /	.285
Burgess Iceberg	ton	50.00 /	80.00
Cryptone BT	lb.	.10 /	.11
Permolith lithopone	lb.	.0825/	.0912
Titanium pigments			
Horse Head Anatase	lb.	.255 /	.27
Rutile	lb.	.275 /	.29
Rayox LW	lb.	.195 /	.205
R-110	lb.	.215 /	.225
Ti-Cal	lb.	075 /	.0825
Ti-Pure	lb.	.195 /	.225
Titanox A, AA, A-168	lb.	.255 /	.265
C-50	lb.	.1438/	.1488
RA, -10, -50	lb.	.275 /	.285
RC	lb.	.0963/	.1013
-HT, -HTX	lb.	.0963/	.0988
Rutile	lb.	.205 /	.29
Unitane	lb.	.255 /	.29
Zopaque Anatase	lb.	.245 /	.27
Zinc oxide, comml.	lb.	.145 /	.1825
Azo ZZZ-11, -44, -55	lb.	.145 /	.155
12% leaded	lb.	.125 /	.135
35% leaded	lb.	.15375/	.16375
50% leaded	lb.	.1575/	.1675
Eagle AAA, lead free	lb.	.145 /	.155
5% leaded	lb.	.145 /	.155
35% leaded	lb.	.15375/	.16375
50% leaded	lb.	.1575/	.1675
Florence Green Seal	lb.	.1625/	.1725
Red Seal	lb.	.1575/	.1675
White Seal	lb.	.1675/	.1775
Horsehead XX-4, -78	lb.	.145 /	.155
Kadox-15, -17, -72, -515	lb.	.145 /	.155
-25	lb.	.15 /	.16
Lehigh, 35% leaded	lb.	.15375/	.16375
50% leaded	lb.	.1575/	.1675
Ozide 10-R	lb.	.135 /	.145
Protox-166, -167	lb.	.145 /	.155
St. Joe, lead free	lb.	.145 /	.175
Zinc sulfide, comml.	lb.	.253 /	.263
Cryptone ZS	lb.	.253 /	.263

HOGGSON

"DUMBBELL" Test Strip Die D412(51T)



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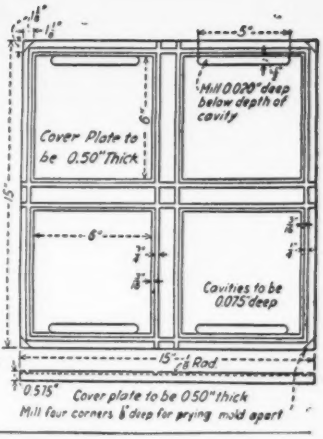

SLAB→ MOLD D15-55

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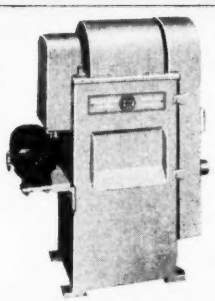

With one single setup you can cut infinitely variable band widths —from 1/16" to 1"— Adjustments can be made while your machine is in operation—600 to 800 cuts per minute.

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NEW YORK OFFICE: 261 BROADWAY

DPR®
DEPOLYMERIZED RUBBER

NATURAL CRUDE RUBBER IN LIQUID FORM 100% SOLIDS

AVAILABLE IN HIGH and LOW VISCOSITIES

DPR, INCORPORATED
A Subsidiary of H. V. HARDMAN CO.
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BELLEVILLE 9, N. J.

DPR TRADE MARK

CONSULTANTS & ENGINEERS

HALE & KULLGREN, INC.
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A Complete Engineering Service
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Installation; Contracting and Operation.
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FOSTER D. SNELL, INC.
29 WEST 15th STREET, NEW YORK 11, N. Y.
SPECIALISTS IN: SOLVING RUBBER PROBLEMS
RUBBER ANALYSIS, COMPOUNDING,
PERFORMANCE EVALUATION
For further information call WA 4-8800 or write to above address.

Yellow

Benzidine 12199	lb.	$0.58 /	$2.55
Cadmium yellow lithopones	lb.	1.12 /	1.15
Cadmolith	lb.	1.12 /	1.20
Chrome	lb.	.135 /	.145
Cyanamid Hansa Yellow	lb.	.93 /	1.22
Du Pont	lb.	2.25	
Filo	lb.	.10	
Iron oxide, comml	lb.	.0525 /	.1175
Lansco synthetic	lb.	.1075	
Mapico pure synthetic	lb.	.12 /	.1275
Williams	lb.	.115 /	.1225
Lightfast Benzidine 12220	lb.	3.40	
Monsanto Yellow 14	lb.	1.91	
10010	lb.	1.91	
BYP-282	lb.	1.21	
GA	lb.	2.45	
S-10010	lb.	1.17	
Stan-Tone			
D-1100	lb.	2.55	
1101	lb.	.69	
Lemon 70 PCO1	lb.	1.77 /	2.19
D-7001	lb.	2.80 /	3.00
Medium yellow 70 PCO2	lb.	1.79 /	2.21
D-7002	lb.	2.98 /	3.18
Vansul masterbatch	lb.	.95 /	1.95
Williams Ocher	lb.	.0575/	.06

Dusting Agents

Antidust	lb.	.405 /	.445
Diatomaceous silica	ton	32.00 /	48.00
Extrud-o-Lube, conc	gal.	1.33 /	1.69
Glycerized Liquid Lubricant, concentrated	gal.	1.25 /	1.63
Glyso-Lube, #3	lb.	.14	
Latex-Lube GR	lb.	.20	
Pigmented	lb.	.1825	
R-66	lb.	.165	
Liqui-Lube	lb.	.1625	
N. T.	lb.	.1675	
Liquizinc No. 305	lb.	.30 /	.35
Lubrex	lb.	.25 /	.30
Mica 160 Biotite	lb.	.065 /	.0725
Mesh	lb.	.08 /	.0875
325 Mesh	lb.	.0825/	.09
Concord	lb.	.08 /	.09
Mineralite	ton	45.00	
Pigmented Separex, LG	lb.	.105	
Pigmented Slab-Dip, S-20	lb.	.11 /	.15
Pyrax A	ton	14.50 /	15.00
W. A.	ton	17.00 /	17.50
Rexanol	lb.	.13	
Talc, comml	ton	18.40 /	38.50
EM	ton	11.00 /	63.00
LS Silver	ton	29.25	
Nytals	ton	28.00 /	38.00
Sierra Sagger 7	ton	34.00	
White IR	ton	19.75	
III	ton	20.75	
Vanfre	gal.	1.95 /	3.00
Wet-Zinc, CW, P	lb.	.20 /	.2225

Extenders

BRS 700	lb.	.02 /	.036
BRT 7	lb.	.035 /	.036
Cumar Resins	lb.	.065 /	.17
Dielex B	lb.	.06	
Factice, Amberex	lb.	.29 /	.36
Brown	lb.	.1425/	.263
Neophax	lb.	.157 /	.268
White	lb.	.144 /	.285
G. B. Asphaltenes	lb.	.097 /	.177
Millex, W	lb.	.07	
Mineral Rubbers			
Black Diamond	ton	38.00 /	40.00
Hard Hydrocarbon	ton	46.50 /	48.50
Hydrocarbon MR	ton	45.00 /	55.00
Parmr	ton	21.00 /	29.00
T-MR Granulated	ton	47.50 /	50.00
Nuba No. 1, 2	lb.	.0575/	.0625
3X	lb.	.0775/	.0825
OPD-101	lb.	.26	
Rubber substitute, brown	lb.	.16 /	.2572
Car-Bel-Ex A	lb.	.14	
Car-Bel-Lite	lb.	.35	
Extender 600	lb.	.1765	
White	lb.	.192 /	.2103
Stan-Shells	ton	35.00 /	73.00
Sublac Resin PX-5	lb.	.215 /	.235
Sundex 53	gal.	.12	
85	gal.	.1725	
Synthetic 100	lb.	.41	
Vistanex	lb.	.35 /	.475

Fillers, Inert

Agrashell flour	ton	50.00 /	74.00
Albacar	ton	55.00 /	75.00
Barytes, floated, white	ton	49.00 /	70.85
No. 1	ton	55.00 /	77.50
2	ton	50.00 /	72.50
Off-color, domestic	ton	25.00	
Sparmite	ton	95.00 /	117.00
Blanc fixe	ton	100.00 /	165.00
Burgess HC-75	ton	12.00 /	30.00
80	ton	14.00 /	32.00
Iceberg	ton	50.00 /	80.00
Pigment #20	ton	35.00 /	60.00
#30	ton	37.00 /	60.00
WP #1	ton	11.00 /	16.00
Camel-Carb	ton	14.00	
-Tex	ton	22.00	
-Wite	ton	35.00	
Cary #200	ton	30.00 /	55.00
Citrus seed meal	lb.	.04	
Oil	lb.	.15	

Note

Suppliers are requested to submit product additions or deletions and price changes promptly as they occur in order that we may make the listing of maximum service to our readers. Comments on the present listing and classifications are invited with a view toward facilitating location of specific items.

Correspondence should be directed to Market Editor, RUBBER WORLD, 630 Third Avenue, New York 17, New York.

Clays			
A. F. D. Filler	ton	$29.50 /	$36.00
Aiken	ton	14.00	
Albacar	ton	50.00 /	55.00
Champion	ton	14.50	
Crown	ton	14.00 /	33.00
Dixie	ton	14.50	
Franklin	ton	13.50 /	35.25
GK Soft Clay	ton	11.00	
Harwick	ton	21.50 /	77.00
Hi-White R	ton	10.00 /	14.50
Hydratex R	ton	28.00	
Kaolloid	ton	10.50	
LGB	ton	17.50	
LGP	ton	20.00	
McNamee	ton	14.50	
RX-43	ton	33.00	
Natka 1200	ton	12.00 /	35.00
Par	ton	12.00	
Paragon	ton	10.00 /	14.50
Polyfil	ton	25.00 /	45.00
Recco	ton	14.00	
Sno-Brite	ton	12.50	
Stan-Clay	ton	28.00	
Stellar-R	ton	50.00	
Suprex	ton	10.00 /	14.50
Swanee	ton	12.50	
Windsor	ton	14.00 /	30.00
DC Silica	lb.	1.15 /	1.40
Diatomaceous silica	ton	32.00 /	48.00
Flocks			
Cotton, dark	lb.	.095 /	.135
Dyed	lb.	.55 /	.60
White	lb.	.13 /	.33
Fabrifil X-24-G	lb.	.135	
X-24-W	lb.	.235	
Filfloc 6000	lb.	.33	
F-40-900	lb.	.135	
HSC #35 Silicone Emulsion	lb.	1.22 /	2.46
Hydrite	ton	25.00 /	50.00
Kalite	ton	52.50 /	67.50
Lithopone, comml	lb.	.075 /	.085
Eagle	lb.	.0725/	.075
Permolith	lb.	.08 /	.0875
Sunolith	lb.	.075 /	.0825
Mica, 160 Biotite	lb.	.065 /	.0725
Mesh	lb.	.08 /	.0875
325 Mesh	lb.	.0825/	.09
Concord	lb.	.08 /	.09
Millical	ton	38.00 /	53.00
Mineralite	ton	40.00 /	60.00
Non-Fer-Al	ton	35.00 /	50.00
Ohio Superspray lime	ton	16.50	
Pulverized limestone, Stonelite	ton	8.25 /	11.00
Purecal	ton	56.75 /	71.75
Pyrax A	ton	13.50	
W. A.	ton	16.00	
Sawdust	ton	14.00 /	35.00
Silversheen Mica	lb.	.08 /	.09
Stan White	ton	10.50 /	13.10
Super-White Silica	ton	25.00 /	46.50
Surfex	ton	37.50 /	52.50
MM	ton	42.00 /	57.00
Suspenso	ton	38.00 /	53.00
Ti-Cal	lb.	.0675	
Valron Estersil	lb.	2.00 /	2.25
Walnut shell flours	ton	50.00 /	84.00
Whiting, limestone			
Atomite	ton	32.50 /	35.00
Calcite	ton	23.00	
Calwhite	ton	20.00 /	27.00
-T	ton	23.00	
Duramite	ton	20.00	
Gamaco	ton	32.50 /	40.00
Keystone	ton	20.00 /	22.00
Laminar	ton	30.00	
No. 10 White	ton	11.00 /	16.50
Omya	ton	30.00	
BSH	ton	45.00	
Paxinosa	ton	14.50 /	22.50
Snowflake	ton	17.00 /	18.00
Witco	ton	13.00	
York	ton	9.50	

Finishes

Apex Bright Finish #5200-E	lb.	.25	
Rubber Finish	gal.	2.50	
Black-out	gal.	4.50 /	8.00
Flocks, Rayon, colored	lb.	$0.90 /	$1.50
White	lb.	.75 /	1.25
Also see Flocks, under Fillers, Inert			
Paraflint RG and RGU Synthetic Wax	lb.	.15 /	.22
Rubber lacquer, clear	gal.	1.00 /	2.00
Shellacs, Angelo	lb.	.485 /	.7325
Vac Dry	lb.	.485 /	.57
Talc (*See Talc, under Dusting Agents*)			
Unidip	lb.	.15 /	.20
Wax, Bees	lb.	.67 /	.83
Carnauba	lb.	.57 /	1.13
Monten	lb.	.27	
Neutral	gal.	.76 /	1.31
No. 118, colors	gal.	.86 /	1.41
Van Wax	gal.	1.45 /	1.50

Latex Compounding Ingredients

Acintol D, DLR	lb.	.0625/	.085
FA #1	lb.	.0675/	.09
#2	lb.	.0825/	.105
Accelerator 552	lb.	2.25	
Accelerator J-117, -302	lb.	1.00 /	1.15
-144	lb.	.15 /	.30
-307	lb.	1.10 /	1.25
-311	lb.	.60 /	.75
Aerosol, dry types	lb.	.65 /	.80
Liquid types	lb.	.40 /	.75
Alcogard 354	lb.	1.40 /	1.42
Alcogum AK-12	lb.	.12 /	.14
AN-6	lb.	.055 /	.06
-10	lb.	.09 /	.10
-25	lb.	.31	
PA-15	lb.	.16	
Alrosol	lb.	.41	
Amberex solutions	lb.	.1675/	.18
Antifoam J-114	lb.	3.25 /	3.45
P-242	lb.	.24 /	.35
Antioxidant J-137, -140	lb.	.55 /	.70
-139, -293	lb.	1.45 /	1.60
-182	lb.	2.00 /	2.15
-186	lb.	1.40 /	1.55
2246	lb.	1.50 /	1.53
Anti Webbing Agent J-183	lb.	.75 /	.90
-297	lb.	.27 /	.40
Aquablak B	lb.	.0975/	.1025
G	lb.	.12 /	.125
K	lb.	.12 /	.125
M	lb.	.105 /	.11
Aquarex D	lb.	.81	
G	lb.	.21	
L	lb.	.94	
MDL	lb.	.33	
ME	lb.	.82	
Aquarex NS	lb.	.60	
SMO	lb.	.50	
WAQ	lb.	.22	
Areskap 50	lb.	.30 /	.38
100, dry	lb.	.60 /	.72
Aresket 240	lb.	.30 /	.38
300, dry	lb.	.60 /	.72
Aresklene 375	lb.	.42 /	.57
Ben-A-Gels	lb.	.98 /	1.40
Bentone 18, 18C	lb.	.45	
34	lb.	.60	
Casein	lb.	.22	
Cellosize WP-09, -3, -40,			
-300	lb.	1.00 /	1.17
CW-12	lb.	.85	
-37	lb.	.70	
DC Antifoam A Compound	lb.	5.45 /	6.65
B	lb.	.63 /	1.10
Emulsion	lb.	2.05 /	4.00
AF Emulsion	lb.	2.05 /	2.85
Compound 7	lb.	5.13 /	6.50
Defoama W-1701	lb.	.125	
Defoamer 115a	lb.	.50	
NDW	lb.	.215 /	.235
Dispersing Agents			
Blancol	lb.	.1525/	.26
N	lb.	.155 /	.26
Darvan Nos. 1, 2, 3	lb.	.22 /	.35
No. 6	lb.	.1525/	.1575
7	lb.	.1875/	.2375
Daxad 11, 21, 23, 27	lb.	.08 /	.30
Dispersaid H7A	lb.	.58	
1159	lb.	.43	
Emulphor ON-870	lb.	.50 /	.70
Igepal CO-630	lb.	.2875/	.47
Igepon T-73	lb.	.285 /	.495
T-77	lb.	.45 /	.69
Indulins	lb.	.06 /	.08
Kreelons	lb.	.132 /	.155
Laurelton Oil	lb.	.18	
Leonil SA	lb.	.52 /	.65
Lomar PW	lb.	.18	
Marasperse CB	lb.	.1225/	.1425
N	lb.	.095 /	.105
Modicols	lb.	.17 /	.58
Nekal BA-75	lb.	.395 /	.54
BX-76	lb.	.63 /	.75
Nopco 1287	lb.	.155 /	.195
Orzan A	lb.	.0325	
S	lb.	.0425	
Pluronics	lb.	.335 /	.40
Polyfons	lb.	.08 /	.09
Sorapon SF-78	lb.	.28 /	.40
Tergitol 7	lb.	.4125/	.44
NPX	lb.	.275 /	.3074
TMN	lb.	.2875/	.32
Trenmine W-30	lb.	.15	
W-40	lb.	.60 /	.75
Triton R-100	lb.	.12 /	.25
X-100, -102, -114	lb.	.255 /	.36
Dispersions			
Agebest 1293-22	lb.	1.90 /	2.00
AgeRite Alba	lb.	3.00	
Powder, Resin D	lb.	.80	
White	lb.	1.80	

LOCKED-IN COLORS

Glidden pigments, possessing highest color stability, protect the sales appeal of your products. Glidden Zopaque® Titanium Dioxide has outstanding whiteness, color retention, gloss and hiding power, low reactivity and superior dispersion properties. Non-bleeding, non-fading Glidden Cadmolith® reds and yellows exhibit high opacity and resistance to acids, alkalies and heat. They are available in ten shades — soft, easy to grind and insoluble in all vehicles.

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Independent motorised two-speed nip adjustment—manual or automatic.

Zero clearance hydraulically maintained to eliminate roll float.

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Drilled rolls for use with H.P.W. system for accurate temperature control.

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OVERSEAS AGENTS THROUGHOUT THE WORLD

Dispersions (*Cont'd*)		
Altax	lb.	$0.75
Shield Nos. 2, 6	lb.	.08
3	lb.	.095
4-35	lb.	.09
5	lb.	.093
7-F, 8	lb.	.165
55	lb.	.18
Iron Oxide, 60%	lb.	.40
L.S.W.	lb.	1.50
No. 305 Liquizinc	lb.	.30 / $0.35
P-33	lb.	.35
Rotax	lb.	.75
Sulfur	lb.	.13 / .15
Telloy	lb.	3.62
Tuads, Methyl	lb.	1.60
Vulcacure NB	lb.	.45
NS	lb.	.75 / 1.05
T.M.D.	lb.	1.14
ZB, ZE, ZM	lb.	.85 / .89
Vulcanizing, C group	lb.	.40 / 1.30
G group	lb.	.45 / .90
N group	lb.	.40 / 1.00
Zetax	lb.	.75
Zimates, Butyl	lb.	1.30
Ethyl, Methyl	lb.	1.35
Zinc oxide	lb.	.40
Emulsions		
AgeRite Spar	lb.	1.00
Stalite	lb.	.75
Superlite	lb.	1.00
Borden Arcco A-25, A-26, 716-30	lb.	.18 / .19
555-40R	lb.	.185 / .205
620-32B	lb.	.20 / .21
716-35	lb.	.17 / .18
1041-21	lb.	.165 / .175
Habuco Resin Nos. 502, 515, 523	lb.	.195 / .20
503	lb.	.22 / .225
504, 526	lb.	.19 / .195
517	lb.	.175 / .18
524	lb.	.155 / .16
Resin A-2	lb.	.16 / .25
P-370	lb.	.175 / .25
X-210	lb.	.12 / .22
Freeze-Stabilizer 322	lb.	.40
12116C	lb.	.52
Hyonic PE 250	lb.	.255 / .295
Igepon T-43	lb.	.145 / .35
T-51	lb.	.125 / .285
-73	lb.	.285 / .495
Ludox	lb.	.1675/ .195
Marmix	lb.	.41 / .48
Merac	lb.	.75 / 1.05
Micronex, colloidal	lb.	.06 / .072
Modical S	lb.	.3084/ .3284
VD	lb.	.1384/ .1584
Monsanto Blue 4685 WD	lb.	1.60
Green 4884 WD	lb.	1.80
Red 127	lb.	1.25
OPD 101	lb.	.16 / .26
Picco Latex Plasticizer A-12	lb.	.069 / .096
Pliolite Latex 150, 190	lb.	.32 / .41
170	lb.	.37 / .46
Polyvinyl methyl ether	lb.	.25 / .45
Resin V	lb.	.13
Roelgel 100C	lb.	.46
Santomerse D	lb.	.44 / .65
S	lb.	.13 / .25
Sellogen Gel	lb.	.1275
Sequestrene AA	lb.	.905 / .975
ST	lb.	.585 / .615
30A	lb.	.245 / .265
Setsit #5	lb.	.75 / 1.05
D #9	lb.	.85 / 1.15
Stablex A	lb.	.80 / 1.10
B, G	lb.	.50 / .95
K	lb.	.27 / .35
P	lb.	.35 / .50
T	lb.	.14 / .22
Surfactol 13	lb.	.345 / .36
Vult-Accel E	lb.	.85 / .92
Webnix	lb.	1.50 / 2.50

Mold Lubricants

A-C Polyethylene	lb.	.30 / .47
Acintol D	lb.	.0625/ .085
Alipal CO-433	lb.	.25 / .45
CO-436	lb.	.22 / .41
Aquarex Compounds	lb.	.21 / .94
Carbowax 200, 300, 400	lb.	.22 / .25
1500	lb.	.225 / .2825
4000	lb.	.31 / .32
6000	lb.	.35 / .36
Castorwax	lb.	.3375/ .3575
Colite Concentrate	gal.	.90 / 1.15
D-Tak Dip #10	gal.	1.50
DC Mold Release Fluid	lb.	3.14 / 4.75
200 Fluid	lb.	3.14 / 4.75
Compound 4, 7	lb.	5.13 / 6.50
Emulsion 7	lb.	1.20 / 1.74
8, 35, 35A, 35B, 36	lb.	1.20 / 1.74
ELA	lb.	.82
FT Wax 200	lb.	.265 / .42
300	lb.	.295 / .45
Glycerized Liquid Lubricant, concentrated	gal.	1.25 / 1.63
Igepals	lb.	.2875/ .74
Igepon AP-78	lb.	.44 / .68
T-43	lb.	.145 / .35
-51	lb.	.125 / .285
-73	lb.	.285 / .495
L-41 Diethyl Silicone Oil	lb.	3.50
Lubrex	lb.	.27 / .32
Lubri-Flo	gal.	10.00 / 12.05
Lustermold	lb.	.41
Mold Lubricant No. 426	lb.	.18
Paste	lb.	.25
Monopole Oil	lb.	.16
Monten Wax	lb.	$0.57
MR-22	gal.	9.95 / $14.95
Para Lube	lb.	.046 / .048
Paraflint RG and RGU Synthetic Wax	lb.	.15 / .22
Plaskon 8406, 8407	lb.	.30 / .37
8416, 8417	lb.	.35 / .42
8429	lb.	.40 / .47
Pluronics	lb.	.335 / .44
Poly-Brite PE-20	lb.	.28 / .42
600	lb.	.42 / .58
Poly-Cone 125X	lb.	1.20 / 1.40
1000	lb.	.93 / 1.06
Polyglycol E series	lb.	.29 / .42
RA-1, -2, -3	gal.	2.25 / 3.00
Rubber Glo	gal.	.94 / .97
Silrex S-1	lb.	.65
SM-33, -55, -61, -62	lb.	1.22 / 1.76
Soap, Hawkeye	lb.	1.25 / 1.45
Purity	lb.	.155 / .165
Sodium stearate	lb.	.40
Stoner's 700 series	gal.	1.20 / 1.25
800 series	gal.	1.26 / 1.70
900 series	gal.	1.55 / 2.55
A Series	gal.	1.80 / 4.50
Ucon 50-HB Series	lb.	.25 / .375
Ulco	lb.	.12 / .23
Vanfre	gal.	1.95 / 3.00

Odorants

Alamasks	lb.	.75 / 6.50
Coumarin	lb.	2.95 / 3.55
Curodex 19	lb.	4.75 / 5.05
188	lb.	5.75
198	lb.	5.75
Ethavan	lb.	6.75 / 7.35
Latex Perfume #7	lb.	4.00
Neutroleum Gamma	lb.	3.60
Rodo	lb.	4.00 / 5.50
Rubber Perfume #10	lb.	2.60
Vanillin, Monsanto	lb.	3.00 / 3.15

Plasticizers and Softeners

Acintol DLR	lb.	.0625/ .085
Adipol 2EH, 10A, XX	lb.	.40 / .435
BCA	lb.	.45 / .475
ODV	lb.	.43 / .465
Admex 710	lb.	.3325/ .3625
711	lb.	.3325/ .3825
744	lb.	.3925/ .3825
Aro Lene #1980	lb.	.10 / .12
Baker AA Oil	lb.	.195 / .24
Crystal O Oil	lb.	.21 / .255
Processed oils	lb.	.215 / .235
Bardol, 639	lb.	.0275/ .0375
B	lb.	.055 / .065
Benzoflex 2-45	lb.	.26 / .29
9-88	lb.	.27 / .30
Bondogen	lb.	.555 / .605
BRC-20	lb.	.022 / .0245
22	lb.	.026 / .0285
30	lb.	.0165/ .025
521	lb.	.023
BRH 2	lb.	.0341/ .0351
BRS 700	lb.	.036
BRT 7	lb.	.035 / .036
BRV	lb.	.0625/ .065
Bunarex Liquid	lb.	.0425/ .0555
Resins	lb.	.065 / .1225
Bunnatol G, S	lb.	.40 / .505
Butac	lb.	.1485/ .1585
Butyl stearate, comml.	lb.	.255
B-17	lb.	.21 / .33
Binney & Smith	lb.	.23 / .26
Harchem	lb.	.2525/ .3425
Kessoflex	lb.	.245 / .275
Ohio-Apex	lb.	.26 / .29
Butyl stearate—G.P.	lb.	.0125/ .02
R-100	lb.	.045 / .0525
TT	lb.	.017 / .02
Califlux 510, 550	lb.	.0275/ .0375
G.P.	lb.	.015 / .0225
R-100	lb.	.0475/ .0575
T-T	lb.	.019 / .0295
Capryl alcohol, comml.	lb.	.195 / .30
Columbian Carbon	lb.	.195 / .30
Harchem	lb.	.195 / .30
Chlorowax 40	lb.	.1625/ .1825
70	lb.	.185 / .245
-S	lb.	.21 / .27
Circo light	gal.	.17
Circosol-2XH	gal.	.185
Contogums	lb.	.0875/ .111
Cumar Resins	lb.	.065 / .17
DBM (dibutyl-m-cresol) Darax	lb.	.32 / .3475
DBP (dibutyl phthalate), comml.	lb.	.26 / .40
Darex	lb.	.30 / .33
Eastman	lb.	.26 / .30
Harflex 140	lb.	.26 / .40
Harwick Std. Chem. Co.	lb.	.325 / .385
Hatco	lb.	.30 / .33
Monsanto	lb.	.26 / .30
Naugatuck	lb.	.30 / .33
Ohio-Apex	lb.	.26 / .30
PX-104	lb.	.26 / .30
Rubber Corp. of America	lb.	.26 / .44
Sherwin-Williams	lb.	.30 / .33
DBS (dibutylsebacate) comml.	lb.	.66 / .69
Eastman	lb.	.655 / .685
Harflex 40	lb.	.655 / .745
Hatco	lb.	.66 / .685
Monoplex	lb.	.66 / .675
Naugatuck	lb.	.665 / .69
PX-404	lb.	.665 / .685
DCP (dicaprylphthalate), comml.	lb.	$0.295 / $0.325
Harflex 180	lb.	.25 / .39
Hatco	lb.	.295 / .325
Monoplex	lb.	.30 / .315
DDA (didecyladipate) Good-rite GP-236	lb.	.40 / .55
Kessoflex	lb.	.40 / .435
DDP (didecylphthalate) Good-rite GP-266	lb.	.295 / .45
Hatco	lb.	.305 / .435
Defoamer X-3	lb.	.355
DIBA (diisobutyladipate) Darex	lb.	.4325/ .4625
Eastman	lb.	.40 / .44
Ohio-Apex	lb.	.41 / .445
DIDA (diisodecyladipate) Monsanto	lb.	.40 / .435
RC	lb.	.40 / .54
DIDP (diisodecylphthalate) Darex	lb.	.32 / .35
Harflex 110	lb.	.26 / .40
Monsanto	lb.	.26 / .30
Ohio-Apex	lb.	.26 / .30
PX-120	lb.	.26 / .30
RC	lb.	.26 / .43
Dielex B	lb.	.06
Diethylene glycol, comml.	lb.	.1525/ .1825
Wyandotte	lb.	.15 / .165
Di-2 ethylhexyl azelate	lb.	.455 / .495
Dinopol IDO	lb.	.285 / .32
DIOA (diisooctyladipate) Harflex 220	lb.	.40 / .495
Kessoflex	lb.	.40 / .435
Naugatuck	lb.	.435 / .465
PX-208	lb.	.40 / .435
Rubber Corp. of America	lb.	.40 / .54
DIOP (diisooctylphthalate), comml.	lb.	.305 / .335
Darex	lb.	.32 / .35
Eastman	lb.	.25 / .29
Harflex 120	lb.	.25 / .39
Hatco	lb.	.305 / .335
Monsanto	lb.	.25 / .29
Naugatuck	lb.	.305 / .335
Ohio-Apex	lb.	.25 / .29
PX-108	lb.	.26 / .30
Rubber Corp. of America	lb.	.25 / .43
Sherwin-Williams	lb.	.32 / .34
DIOS (diisooctylsebacate), comml.	lb.	.61 / .64
Rubber Corp. of America	lb.	.5925/ .70
DIOZ (diisooctylazelate) Cabflex	lb.	.48 / .51
Dipolymer Oil	gal.	.33 / .38
Dispersing Oil No. 10	lb.	.06 / .0625
DNODA (di-n-octyl-n-decyl adipate), Monsanto	lb.	.40 / .435
DOA (dioctyladipate), comml.	lb.	.425 / .455
Eastman	lb.	.40 / .43
Good-rite GP-233	lb.	.40 / .55
Harflex 250	lb.	.40 / .495
Hatco	lb.	.435 / .465
Monsanto	lb.	.40 / .435
Naugatuck	lb.	.435 / .465
PX-238	lb.	.40 / .435
Rubber Corp. of America	lb.	.40 / .54
DOP (dioctylphthalate), comml.	lb.	.305 / .335
Darex	lb.	.32 / .35
Eastman	lb.	.28 / .315
Good-rite GP-261	lb.	.285 / .44
Harflex 150	lb.	.25 / .39
Hatco	lb.	.305 / .335
Monsanto	lb.	.25 / .29
Naugatuck	lb.	.305 / .335
Ohio-Apex	lb.	.25 / .29
Polycizer 162	lb.	.28 / .435
PX-138	lb.	.25 / .29
Rubber Corp. of America	lb.	.25 / .43
Sherwin-Williams	lb.	.305 / .335
DOS (dioctylsebacate) comml.	lb.	.61 / .64
Eastman	lb.	.61 / .64
Harflex 50	lb.	.5925/ .6825
Hatco	lb.	.61 / .635
Monoplex	lb.	.61 / .635
Naugatuck	lb.	.615 / .64
PX-438	lb.	.5925/ .6225
Rubber Corp. of America	lb.	.5925/ .70
Drapex 3.2	lb.	.40 / .54
Dutch Boy NL-A10 (DBP)	lb.	.30 / .33
-A20 (DOP), A30 (DIOP)	lb.	.305 / .335
-A54	lb.	.295 / .325
-C20 (DOS)	lb.	.61 / .63
-F21	lb.	.395 / .425
-F31	lb.	.44 / .47
-F41	lb.	.48 / .51
Dutrex 6	lb.	.025 / .035
Dymerex Resin	lb.	.135 / .1475
Elastex 36-R	lb.	.43 / .4625
37-R	lb.	.70 / .71
Emulphor EL-719	lb.	.52 / .73
Endor	lb.	.67
Ethox	lb.	.43 / .455
Ethylene glycol, comml.	lb.	.135 / .165
Wyandotte	lb.	.1325/ .1425
Flexol 3 GH	lb.	.44 / .46
3 GO	lb.	.53 / .55
4 GO	lb.	.325 / .355
10-A	lb.	.425 / .455
426	lb.	.27 / .30
810, 810X, 10-10, 10-10X	lb.	.305 / .335
TPF, A-26	lb.	.435 / .465
Flexricin P-4	lb.	.3475/ .3625
P-6	lb.	.415 / .43

Flexricin P-8	lb.	$0.3475	$0.3625
PG-10	lb.	.335 /	.35
Fortex	lb.	.125 /	.145
Fura-Tone NC 1008	lb.	.28	
1012	lb.	.46	
G. B. Asphaltic Flux	gal.	.097 /	.177
Naphthenic Neutrals	gal.	.125 /	.215
Process oil, light	lb.	.0275/	.0375
Medium	lb.	.0375/	.0475
Galex W-100	lb.	.155 /	.18
W-100 D	lb.	.1525/	.1775
Gilsowax B	lb.	.0975/	.11
Harchemex	lb.	.24 /	.345
Harflex 300	lb.	.58 /	.675
325	lb.	.4325/	.52
375	lb.	.7425/	.83
500	lb.	.315 /	.41
HB-20	lb.	.19 /	.22
-40	lb.	.15 /	.17
Heavy Resin Oil	lb.	.0225/	.0375
HSC-13	lb.	.25 /	.32
-39	lb.	.22 /	.29
Hycar 1312	lb.	.60	
Kapsol	lb.	.33 /	.355
Kenflex A, L	lb.	.26 /	.27
B	lb.	.23 /	.24
N	lb.	.18 /	.19
Kessoflex 103	lb.	.405	
105	lb.	.3325	
106	lb.	.38	
107	lb.	.525	
110	lb.	.24	
111	lb.	.28	
KP-23	lb.	.325 /	.335
-90	lb.	.40 /	.435
-140	lb.	.46 /	.485
-201	lb.	.45 /	.465
-220	lb.	.33 /	.365
-555	lb.	.59 /	.60
Kronisol	lb.	.34 /	.375
Kronitex AA, I, K-3, Mx	lb.	.325 /	.36
LX-685, -125, -135	lb.	.125 /	.135
Marvinol plasticizers	lb.	.28 /	.8825
Methox	lb.	.375 /	.40
Millrex	lb.	.15	
Monoplex S-38	lb.	.215 /	.24
S-71	lb.	.45 /	.475
Morflex	lb.	.25 /	.65
Natac	lb.	.1435	.1535
Neoprene Peptizer P-12	lb.	1.05	
Nevillac	lb.	.31 /	.85
Neville R Resins	lb.	.145 /	.205
Nevinol	lb.	.24	
No. 1-D heavy oil	lb.	.065	
NP-10	lb.	.44 /	.48
ODA (octyldecyladipate)			
Good-rite GP-235	lb.	.40 /	.55
Kessoflex	lb.	.40 /	.435
RC	lb.	.40 /	.54
ODP (octyldecylphthalate)			
Good-rite GP-265	lb.	.29 /	.445
Hatco	lb.	.305 /	.335
Rubber Corp. of America	lb.	.255 /	.43
Ohopex Q-10	lb.	.265 /	.305
R-9	lb.	.3525/	.3775
Orthonitro benzophenol, comml.	lb.	.13 /	.15
Palmalene	lb.	.15	
Panaflex BN-1	lb.	.185 /	.225
Panarez Resins	lb.	.09 /	.14
Para Flux, regular	gal.	.10 /	.2125
No. 2016	gal.	.165 /	.24
2332	gal.	.11	
4205	lb.	.1075/	.2125
Para Lube	lb.	.46 /	.48
Resins	lb.	.04 /	.045
Paradene Resins	lb.	.07 /	.08
Paraplex 5-B	lb.	.29 /	.3475
Al-111	lb.	.32 /	.3275
G-25	lb.	.76 /	.77
-40	lb.	.4825/	.51
-50	lb.	.39 /	.4175
-53	lb.	.4325/	.46
-60	lb.	.325 /	.35
-62	lb.	.345 /	.37
RG-7	lb.	.33 /	.335
-8	lb.	.505 /	.5125
-10	lb.	.52 /	.5275
Pepton 22	lb.	.83 /	.86
65	lb.	1.23 /	1.26
65-B	lb.	.83 /	.86
Philrich 5	gal.	.125	
Picco Resins	lb.	.1275/	.22
480 Oilproof Series	lb.	.18 /	.23
Aromatic Plasticizers	lb.	.05 /	.065
Liquid Resin D-165 (Y)	lb.	.06 /	.075
(Z-3)	lb.	.07 /	.085
(Z-6)	lb.	.08 /	.095
S. O. S	gal.	.29 /	.34
Piccocizers	lb.	.04 /	.055
Piccolastic Resins	lb.	.16 /	.25
Piccolyte Resins	lb.	.205 /	.245
Piccopale Resins	lb.	.12 /	.135
Piccovars	lb.	.165 /	.20
Piccovol	lb.	.025 /	.038
Pictar	gal.	.25 /	.30
Pigmentar	lb.	.046 /	.0634
Pigmentaroil	lb.	.046 /	.0634
Pitch, Burgundy, Sunny South	lb.	.103 /	.1085
Pitt-Consol 500	lb.	.28 /	.305
640	lb.	.42	
Plasticizers			
42	lb.	.34 /	.40
84	lb.	.25 /	.29
B	lb.	.35 /	.45
DP-520	lb.	.435 /	.455
MP	lb.	.035 /	.0755
MT-511	lb.	.6925/	.7425
ODN	lb.	$0.35 /	$0.475
SC	lb.	.38 /	.55
Plastoflex #3	lb.	.52 /	.57
#520	lb.	.36 /	.435
DBE	lb.	.50 /	.55
MGB	lb.	.29 /	.37
SP-2	lb.	.43 /	.48
VS	lb.	.3575/	.3975
Plastogen	lb.	.0875/	.09
Plastone	lb.	.25 /	.32
Polycin 470	lb.	.325 /	.34
Polycizers	lb.	.25 /	.415
162	lb.	.25 /	.405
Polymel-C	lb.	.1775/	.1875
DX, C-130	lb.	.1375/	.1475
D	lb.	.225 /	.235
D-TAC	lb.	.1975/	.215
Poly-Sperse AP-2	lb.	.23 /	.295
AP-300	lb.	.26 /	.325
LC-20	lb.	.26 /	.325
R-100	lb.	.17 /	.235
PT Pine Tars	lb.	.038 /	.0554
101 Pine Tar Oil	lb.	.038 /	.0554
Reogen	lb.	.1425/	.145
Resin C pitch	lb.	.0225/	.031
Resin R6-3	lb.	.38 /	.40
Resinex 10, 25, 50, 110	lb.	.04 /	.045
70	lb.	.0325/	.0375
85, 100	lb.	.035 /	.04
115	lb.	.0375/	.0425
L-2, L-3, L-4, L-5	lb.	.025/	.03
Rosin Oil, Sunny South	gal.	.58 /	.76
RPA No. 2	lb.	.85	
3	lb.	.51	
Conc.	lb.	.85	
6	lb.	1.66	
RSN Flux	gal.	.10 /	.91
Rubber Oil B-5	lb.	.0225/	.0355
Rubberol	lb.	.18 /	.2725
Santicizer 1-H	lb.	.50 /	.52
8	lb.	.44 /	.46
9	lb.	.42 /	.44
140	lb.	.325 /	.36
141	lb.	.34 /	.375
160	lb.	.25 /	.29
409	lb.	.39	
602	lb.	.285	
B-16	lb.	.4475/	.4675
E-15	lb.	.51 /	.54
Santocizer	lb.	.4275/	.4575
Sebacic acid, purified, comml.	lb.	.59 /	.65
Binney & Smith	lb.	.64 /	.76
C. P.-Binney & Smith	lb.	.72 /	.84
Harchem	lb.	.655 /	.815
Sherolatum Petroleum	lb.	.05 /	.10
Softener #20	gal.	.10 /	.20
Special Rubber Resin 100	lb.	.1675/	.2175
Staflex AX	lb.	.43	
DBES	lb.	.61 /	.635
Syn-Tac	gal.	.33 /	.635
Synthol	lb.	.17 /	.2625
Tetraflex R-122	lb.	.245 /	.285
Thiokol TP-90B	lb.	.59	
-95	lb.	.65	
Triacetin	lb.	.37 /	.41
Tributyl phosphate	lb.	.50 /	.535
Tributyrin	lb.	.69	
Tricresyl phosphate, comml.	lb.	.33 /	.36
Monsanto	lb.	.325 /	.36
Naugatuck	lb.	.33 /	.36
PX-917	lb.	.33 /	.36
Triphenyl phosphate, comml.	lb.	.39 /	.40
Monsanto	lb.	.415 /	.435
Turgum S	lb.	.131 /	.141
SB	lb.	.095 /	.105
Turpol NC 1200	lb.	.61 /	.70
Tysonite	lb.	.3025/	.305
United	gal.	.69 /	1.20
X-1 Resinous Oil	lb.	.0225/	.0325

Reclaiming Oils

Bardol, 639	lb.	.0275/	.0375
B	lb.	.055 /	.065
BRH 2	lb.	.0213/	.0351
BRT 3	lb.	.02 /	.031
4	lb.	.02 /	.031
7	lb.	.035 /	.036
BRV	lb.	.0625/	.065
Burco-RA	lb.	.053 /	.0805
BWH-1	lb.	.16 /	.17
Dipolymer Oil	gal.	.33 /	.43
Dispersing Oil No. 10	lb.	.06 /	.0625
G. B. Oils	gal.	.115 /	.275
Heavy Resin Oil	lb.	.0225/	.0375
LX-572	gal.	.27 /	.32
-759	gal.	.1375	
-777, -809, -859	gal.	.23 /	.33
-869	gal.	.33 /	.43
-871	gal.	.34 /	.44
No. 3186	gal.	.28 /	.295
Picco 6535	gal.	.25 /	.30
C-33	gal.	.215 /	.315
-42	gal.	.23 /	.33
D-4	gal.	.27 /	.37
E-5	gal.	.25 /	.35
Q-Oil	gal.	.286 /	.36
Pitt-Consol 500	lb.	.28 /	.305
640	lb.	.42	
PT 101 Pine Tar Oil	lb.	.038 /	.0554
Reclaiming Oil #3186	gal.	.28 /	.385
-G	gal.	.25 /	.365
4039-M	gal.	.3275/	.3975
-Y	gal.	.30 /	.37
RR-10	lb.	.37	
S. R. O.	lb.	.015 /	.0225
X-1 Resinous Oil	lb.	.0225/	.0325

Reinforcers, Other Than Carbon Black

Angelo Shellacs	lb.	$0.485 /	$0.7325
Borden, Chem. Div.			
Arcco 978-42B	lb.	.18 /	.19
1073-18B	lb.	.135 /	.145
1294-36B	lb.	.115 /	.125
1301-12B	lb.	.15 /	.16
BRC-20	lb.	.0235/	.0245
22	lb.	.026 /	.0285
30	lb.	.0165/	.025
521	lb.	.023	
Bunarex Resins	lb.	.065 /	.1225
Cab-o-sil	lb.	.66 /	1.45
Calcene CO	ton	105.00 /	125.00
NC	ton	80.00 /	100.00
TM	ton	82.50 /	102.50
Car-Bel-Rez C	lb.	.126 /	.1451
Clays			
Aiken	ton	14.00	
Buca	ton	45.00	
Burgess Iceberg	ton	50.00 /	80.00
Icecap K	ton	65.00 /	90.00
Burgess Pigment #20	ton	35.00 /	60.00
#30	ton	37.00 /	60.00
Catalpo	ton	35.00	
Crown	ton	14.00 /	33.00
Dixie	ton	14.50	
Franklin	ton	13.50 /	35.25
L. G. B.	ton	17.50	
McNamee	ton	14.50	
Par	ton	15.00	
Paragon	ton	10.00 /	14.50
Pigment No. 33	ton	37.00	
Polyfil C	ton	25.00	
Recco	ton	14.00	
Suprex	ton	10.00 /	14.50
Swanee	ton	12.50	
Whitetex	ton	50.00	
Windsor	ton	14.00 /	30.00
Witco No. 1	ton	14.00 /	30.00
No. 2	ton	13.50 /	30.00
Clearcarb	lb.	.1175/	.1255
Cumar Resins	lb.	.065 /	.17
Darex Resins	lb.	.42 /	.49
DC Silica	lb.	1.15 /	1.40
Diatomaceous silica	ton	32.00 /	48.00
Good-rite 2007	lb.	.36 /	.38
2057	lb.	.30 /	.31
Hi-Sil 233	lb.	.0825/	.0975
X303	lb.	.40 /	.45
Hycar 2001	lb.	.55	
2007	lb.	.39	
Indulins	lb.	.06 /	.08
Kralac A-EP	lb.	.43 /	.54
Laminar	ton	30.00	
Magnesium carbonate			
Marinco CL	lb.	.11 /	.14
Marbon Resins	lb.	.36 /	.43
Multifex MM	ton	117.50 /	137.50
Super	ton	167.50 /	187.50
Neville Resins			
465	lb.	.075 /	.08
LX-509	lb.	.33 /	.35
Nebony	lb.	.045 /	.05
Paradene	lb.	.07 /	.08
R	lb.	.145 /	.205
Para Resins 2457	lb.	.04 /	.045
Parapol S-Polymers	lb.	.44	
Picco Resins	lb.	.1275/	.22
Piccolyte Resins	lb.	.205 /	.27
Piccoumaron Resins	lb.	.07 /	.195
Piccovars	lb.	.145 /	.20
Pliolite NR types	lb.	.98 /	1.33
S-3	lb.	.42 /	.49
-6	lb.	.36 /	.43
B	lb.	.36 /	.43
E	lb.	.36 /	.43
Plio-Tuf G85C	lb.	.52 /	.59
Purecal M	ton	56.75 /	71.75
SC, T	ton	110.00 /	125.00
U	ton	120.00 /	135.00
R-B-H 510	lb.	.15 /	.22
Resinex	lb.	.0375/	.0525
Rubber Resin LM-4	lb.	.28 /	.35
Silene EF	lb.	.06 /	.07
L	lb.	.0575/	.0675
Silvacons	ton	55.00 /	85.00
Transphalt	lb.	.0375/	.0575
Witcarb P	ton	117.50 /	153.50
R	ton	127.50 /	163.50
Regular	ton	60.00 /	96.00
Zeolex 23	lb.	.06 /	.07
Zinc oxide, commercial†	lb.	.145 /	.155

Retarders

Benzoic acid TBAO-2	lb.	.44	
Good-rite Vultrol	lb.	.62 /	.66
R-17 Resin	lb.	.1075/	.36
Retarder ASA	lb.	.57	
E-S-E-N	lb.	.39 /	.41
J	lb.	.68 /	.70
PD	lb.	.39 /	.41
W	lb.	.46 /	
Retardex	lb.	.47 /	.50
Thionex	lb.	1.14	
Wiltrol P	lb.	.37 /	.39

Solvents

Bondogen	lb.	.555 /	.605
Butyrolactone	lb.	.60 /	.65
Cosol #1	gal.	.37 /	.43
#2	gal.	.42 /	.48
Dichloro Pentanes	lb.	.04 /	.07
Dipentene DD, Sunny South	gal.	.42 /	.63
Ethylene dichloride, comml.	lb.	.09 /	.122

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1421 N. Garvin Street
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Large Eastern Rubber Company has an opening for an experienced Rubber Roll Compounder. Graduate engineer with at least five years' experience compounding for papermill and textile rolls wanted. Excellent opportunity for the right man. All replies held strictly confidential. Address Box No. 2400, care of RUBBER WORLD.

RUBBER AND PLASTICS CHEMIST

Experienced rubber and plastics chemist for development, processing, and quality control of compounds for wire and cable. Medium sized wire and cable company. Six to eight years' experience in the industry required. Address Box No. 2399, care of RUBBER WORLD.

DEVELOPMENT ENGINEER

Should have group management ability and knowledge of the rubber industry. Excellent opportunity with well-established and growing eastern manufacturer of power transmission and conveyor belting. Salary commensurate with qualifications. Write in full giving industry experience and personal background. Your reply will be held in strict confidence. Address Box No. 2404, care of RUBBER WORLD.

SITUATIONS OPEN (Cont'd)

CHIEF CHEMIST—COMPOUNDER

Rapidly expanding precision molded goods mfr. wants Chief Chemist with experience in high-temperature fuel & oil resistant stocks. Address Box No. 2402, care of RUBBER WORLD.

TECHNICAL SERVICE AND SALES

Man to work with Sales Representatives in Eastern United States and Canada. Calling on Paint, Plastic, Rubber, Paper, and allied companies for Calcium Carbonate Sales and Technical Service. Must be free to travel. Sales experience to the above type of industry helpful, but not essential. Write giving detailed résumé to

J. J. Harrison
HARRY T. CAMPBELL SONS' CORPORATION
Baltimore 4, Maryland

TECHNICAL SALES, YOUNG MAN CHEMICAL DEGREE WITH

3-5 years' experience rubber compounding. Articulate, with keen desire to sell. Address Box No. 2403, care of RUBBER WORLD.

RUBBER CHEMISTS—LEADING SOUTHERN CALIFORNIA RUBber company has excellent opportunity for men experienced in rubber, silicone, plastics compounding. Chemistry or chemical engineering degree desirable. Progressive, expanding company with advancement opportunities. Send résumé, age, salary, to KIRKHILL RUBBER CO., Brea, Calif.

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PRODUCTION ENGINEER

The tremendous growth of the silicone elastomer production operation has created a need for an engineer to provide technical guidance and control of production by streamlining processes . . . setting up standards for production scheduling and materials handling . . . establishing use of work simplification procedures . . . instituting time standards . . . and investigating new packaging techniques.

Imagination and ability to work with people are the keys to personal growth in this rapidly expanding industry.

BS in Industrial Engineering, Mechanical Engineering or Chemical Engineering with 5 years' minimum experience. Industrial experience in production operations preferred.

Send resumé in confidence to:
Mr. R. W. Clark
Manager, Employee Relations

SILICONE PRODUCTS DEPARTMENT

GENERAL ELECTRIC

WATERFORD, NEW YORK

ELASTOMER RESEARCH & DEVELOPMENT

Our expanding program requires a man to head research and development activities on elastomers. This person will help to formulate and guide research and will develop applications for new products.

Position requires initiative and creative ability with a reasonably broad background in and knowledge of rubbers and their applications.

This is a major opportunity in a rapidly expanding chemical organization near Parkersburg, a city of 60,000 in the industrial Ohio River Valley. All replies held strictly confidential. Write, giving details of experience to:

E. M. Mills, Personnel Director

MARBON CHEMICAL
P.O. Box 68, Washington, West Virginia

Division of Borg-Warner

Hi-Flash 2-50-W	gal.	$0.41	
Pale yellow	gal.	.39	
LX-572	gal.	.27 /	$0.32
-748	gal.	.16 /	.23
Methyl-2-pyrrolidone	lb.	.75 /	.80
Neville Nos. 100, 104	gal.	.52 /	.60
106	gal.	.38 /	.46
Nevsolv H, 200	gal.	.19 /	.29
HF, T, 30	gal.	.24 /	.34
Penetrell	gal.	.42 /	.63
Picco Hi-Solv Solvents	gal.	.16 /	.48
Pine Oil DD, Sunny South	lb.	.15	
Skellysolve-B	gal.	.17	
-C	gal.	.162	
-H	gal.	.148	
-R, -V	gal.	.139	
Stauffer Carbon Disulfide	lb.	.0525/	.085
Tetrachloride	lb.	.0825/	.475

Tackifiers

Actinol DLR	lb.	.0625/	.085
Bardol, 639	lb.	.0275/	.0375
Borden, Arcco			
A25, A26, 716-30	lb.	.18 /	.19
555-40R	lb.	.185 /	.205
620-32B	lb.	.20 /	.21
716-35	lb.	.17 /	.18
1041-21	lb.	.165 /	.175
BRH 2	lb.	.0213/	.0351
Bunarex Resins	lb.	.065 /	.1225
Chlorowax 70	lb.	.18 /	.24
Contogums	lb.	.0875/	.11
Cumar Resins	lb.	.065 /	.17
Galex W-100	lb.	.155 /	.17
W-100D	lb.	.1525/	.1625
Indopol H-35	gal.	.65 /	.84
H-50	gal.	.70 /	.89
-100	gal.	.85 /	1.08
-300	gal.	1.00 /	1.24
-1500	gal.	1.48	
L-10	gal.	.40 /	.59
-50	gal.	.45 /	.64
-100	gal.	.55 /	.74
Kenflex resins	lb.	.18 /	.27
Koresin	lb.	.90 /	1.10
Natac	lb.	.12 /	.13
Nevindene	lb.	.15 /	.18
Picco Resins	lb.	.1275/	.22
Piccolastic Resins	lb.	.1855/	.34
Piccolyte Resins	lb.	.185 /	.25
Piccopale Resins	lb.	.089 /	.13
Piccoumaron Resins	lb.	.07 /	.185
R-B-H 510	lb.	.15 /	.22
Roelflex 1118A	lb.	.39	
Synthetic 100	lb.	.41	
Synthol	lb.	.17 /	.2625
United	gal.	.69 /	1.20

Vulcanizing Agents

Dibenzo G-M-F	lb.	2.60	
G-M-F #113, #117	lb.	.90	
Di-Cup	lb.	1.10	
Dodecenylsuccinicanhydride	lb.	.75 /	.76
HMDA-Carbamate	lb.	4.50 /	4.90
Ko-Blend I, S	lb.	.39	
Litharge (*See Accelerator-Activators, Inorganic*)			
Magnesium oxide	lb.	.2525/	.38
Maglite D, K, Y	lb.	.2525/	.305
L	lb.	.2975/	.3225
M	lb.	.27 /	.32
Marmag	lb.	.2475/	.295
Michigan No. 1782	lb.	.2525/	.30
PSD 85	lb.	.37 /	.50
Red Lead (*See Accelerator-Activators, Inorganic*)			
Sulfasan R	lb.	1.55 /	1.57
Sulfur flour, commil	100 lbs.	2.55 /	3.30
1018		.12 /	.1575
Aero	100 lbs.	2.40 /	7.75
Crystex	lb.	.195 /	.23
Insoluble 60	lb.	.125 /	.13
Rubbermakers	100 lbs.	2.65 /	4.55
Stauffer	lb.	.0265/	.054
Telloy	lb.	3.50	
VA-7	lb.	.50	
Vandex	lb.	7.00	
Vultac No. 2	lb.	.47 /	.74
3	lb.	.51 /	.78
White lead silicate (*See Accelerator-Activators, Inorganic*)			

Rayon and Nylon

(*Continued from page 569*)

rayon in price. The most popular type of Tyrex, 1100 denier, has been selling for 62¢ a pound; while 1650 denier Tyrex cost 55¢ a pound.

Just about presstime Beaunit Mills, Inc., New York, and its subsidiaries followed the nylon price reductions with an announcement of a price reduction of 5¢ a pound on its Tyrex viscose tire yarn so that the 1100 denier is reduced to 57¢ a pound, and the 1650 denier to 50¢ a pound.

I. Rogosin, president of Beaunit, explained that his company intends its Tyrex tire yarn to continue to be the best value in the market, giving the public the maximum in safety and comfort at the lowest price.

Du Pont also cut the price of its 720 denier nylon yarn for passenger tire cord by five cents, or 4.5%, to $1.05 a pound. Chemstrand, jointly owned by American Viscose Corp. and Monsanto Chemical Co., matched this reduction, too.

Also received were price reduction announcements on Tyrex viscose tire yarn from American Enka Corp., New York, and American Viscose Corp., New York. Both companies reduced the price 5¢ per pound on the 1100 and 1650 denier yarns, matching the prices given by Beaunit Mills.

Totaled packaged production of rayon and acetate filament yarn during November was 58,000,000 pounds, consisting of 25,100,000 pounds of high-tenacity rayon yarn and 32,900,000 pounds of regular-tenacity filament yarn. Production for October had been: total, 59,800,000 pounds; high-tenacity, 26,500,000 pounds, and regular-tenacity, 33,300,000 pounds.

Filament yarn shipments for November to domestic consumers totaled 54,600,000 pounds, of which 23,500,000 pounds were high-tenacity rayon yarn, and 31,100,000 pounds were regular-tenacity rayon yarn. Shipments for October had been: total, 57,700,000 pounds; high-tenacity, 25,300,000 pounds; regular-tenacity, 32,400,000 pounds.

Rayon Prices

Tire Fabrics

1100/490/2	$0.625/$0.78
1650/908/2	.685
2200/980/2	.655

HELP WANTED!

We are now collecting and compiling the information for a new edition of "Compounding Ingredients for Rubber" and need your help in insuring complete listings.

Will you, therefore, please answer and return to RUBBER WORLD as soon as possible any questionnaires, corrections, additions, and/or deletions, we may send you relative to this matter.

If you do not hear from us shortly, will you please notify us so that your name may be added to our lists.

Your cooperation is greatly appreciated.

THE EDITORS.

Tire Yarns

High-Tenacity		
1100/ 490, 980	$0.57/	$0.66
1100/ 490	.57/	.66
1150/ 490, 980	.59/	.63
1165/ 480	.59/	.66
1230/ 490	.59/	.63
1650/ 720	.50/	.60
1650/ 980	.50/	.58
1875/ 980	.55/	.58
2200/ 960	.49/	.57
2200/ 980	.49/	.57
2200/1466	.49/	.64
4400/2934		.60
Super-High Tenacity		
1650/ 720	.50/	.60
1900/ 720		.58

Nylon Prices

Tire Yarns

840/140	.97
1680/280	.97

Synthetic Rubbers

(*Continued from page 570*)

Cold SBR Oil-Black Masterbatch

Ameripol 1805	$0.155[a] /	$0.161[a]
4750	.1545[a]/	.1605[a]
4751	.140[a] /	.146[a]
4752	.160[a] /	.166[a]
4753	.148[a] /	.154[a]
Baytown 1801		.176[b]
Carbomix 3751, 3758	.1545[a]/	.1605[a]
3753, 3759	.164[a] /	.170[a]
3755	.147[a] /	.153[a]
3756	.1576[a]/	.1636[a]
3757	.148[a] /	.154[a]
Gentro-Jet 9250		.158
9251		.164
9252		.167
9275		.150
OB-102		$0.1825[a]
-104		.1475[a]
-106		.151[a]
-110		.141[a]
-111		.154[a]
-113		.175[a]
-114C		.142[a]
Philprene 1803	$0.174[b] /	.18[b]
1805	.155[b] /	.161[b]
6604	.208[b] /	.214[b]
6608	.146[b] /	.152[b]
6620	.1545[b]/	.1605[b]
6661	.182[b] /	.188[b]
6682	.148[b] /	.154[b]
S-1803		.165[a]
-1804		.175[a]
Synpol 8250	.174[b] /	.18[b]
8253	.1584[b]/	.1644[b]
8254	.1545[b]/	.1605[b]
8255	.148[b] /	.154[b]
8266	.1598[b]/	.1658[b]

Cold SBR Rosin Masterbatch

Copo 3900	.231[a] /	.237[a]

Cold SBR Latex

CL-101		.28[a]
Copo 2101	.30[a] /	.4025[a]
2102, 2105, 2110, 3851	.32[a] /	.3725[a]
2108	.30[a] /	.3675[a]
2109	.2775[a]/	.3450[a]
3852	.2900[a]/	.3500[a]
FR-S 2105	.32[a] /	.366[a]
Naugatex 2105, 2107	.32[a] /	.38[a]
2108	.30[a] /	.38[a]
2113	.29[a] /	.36[a]
Pliolite Latex 2101		.30[a]
2105, 2107		.32[a]
2108		.30[a]
Polysar Latex 721		.32[a]
S-2101		.26[a]
-2105		.28[a]
-2107		.32[a]
-2108		.29[a]

Misc. SBR

FR-S-110 (latex)	.3000[a]	
-150 (latex)	.3000[a]	
-174 (latex)	.2950	
-176 (latex)	.2775[a]	
-182	.241[a] /	.247[a]
-184	.1885[a] /	.1945[a]

Urethane Types

Adiprene L, LD-167,-213	1.15 / 1.65

SITUATIONS OPEN (Cont'd)

RUBBER TECHNOLOGIST

WANTED: Rubber Technologist with imagination, ingenuity and drive, for product development. Three to five years experience in compounding and processing of molded rubber preferred. Opportunities for growth; good benefits; modern laboratory and latest facilities. North Central New Jersey. Salary open. Send resume to: Personnel Manager, Johns-Manville Research Center, Manville, New Jersey.

SITUATIONS WANTED

CHEMIST AND ENGINEERING TECHNOLOGIST—B.S., Ph.D. level. Long experience in rubber, latex, resins, plastics, and related materials. Pressure-sensitive development and manufacture. Chemical development, engineering, and mechanical experience. Administrative and consulting experience. Patents registered. Mature age. Full time connection or consulting basis considered. Eastern location preferred. Address Box No. 2398, care of RUBBER WORLD.

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—FOR SALE—

4—Blaw Knox 6′ x 40′ Horizontal Vulcanizers with quick-opening doors, 250# working pressure, ASME.
2—Royle #½ Extruders, complete.
1—Peerless Guillotine Cutter, 30″ blade, with motor.
1—Allen 4″ Extruder with 25 HP motor.
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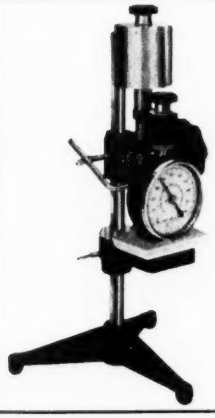
6—NEW FARREL-BIRMINGHAM 14″ X 30″ TWO-ROLL MILLS. Other sizes up to 60″. Hydraulic Presses, 300-ton upstroke 40″ x 30″, 300-ton upstroke 22″ x 35″, 240-ton upstroke with ten 24″ x 56″ platens, 200-ton Farrel 30″ x 30″, 150-ton Farrel 24″ x 24″, Adamson 6″ Rubber Extruder. New and used Laboratory 6″ x 13″, 6″ x 16″, and 8″ x 16″ Mills and Calenders. Baker-Perkins and Day Heavy-Duty Jacketed Mixers, up to 200 gallons. Hydraulic pumps and accumulators. Cumberland #½ Rotary Cutter 5 HP and other sizes. Banbury Mixers, Crushers, Churns, Tubers, Vulcanizers. Bale Cutters, Gas Boilers, etc. SEND FOR SPECIAL BULLETIN. WE BUY YOUR SURPLUS MACHINERY. STEIN EQUIPMENT COMPANY, 107—8th STREET, BROOKLYN 15, NEW YORK. STERLING 8-1944.



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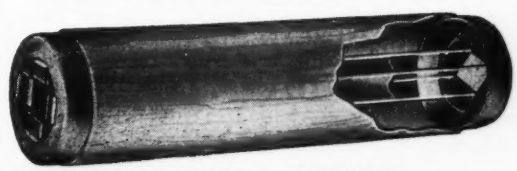

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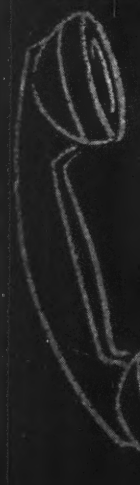

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"NEW YEAR'S SPECIALS"
84", 2-roll top cap Rubber Mill, A-1 condition. Late!
250-Ton Southwark, 3-opening hydraulic press. 4 steam platens 60" x 48" each, with lift tables.
Black Rock Guillotine Cutter. Model 4-KAT with 14" knife.
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FOR SALE—1—10" X 17"—4-ROLL FARREL CALENDER, M. D.; 1—16" x 40"—2-roll Thropp mill, M. D.; 1—16" x 48" Farrel 3-roll calender, M. D.; 1—3½" National Erie extruder, M. D.
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Baker-Perkins Heavy-Duty Jacketed Double-Arm Mixers to 300 Gal. Farrel-Birmingham and Other Two-Roll Rubber Mills, 14" x 30", 16" x 42", 18" x 42", 22" x 60"; Late-Type Top Cap. 2-Roll Horizontal Calender 12" x 24", with 15 HP Motor and Drive. Birmingham 3-Roll Calender 22" x 58", with 125 HP Motor and Drive. Banbury "Type B" Mixer; Utility Rubber Cutter; Flow Meter Combinators; Chemicolloid Mill, Model A 15, SS Rotor-Stator, 15 HP 3525 RPM Motor; Stokes Vacuum Impregnator Model 5648; 100 PSI Internal and Jacketed. EXTRUDERS: Royle 1⅛", 2¼"; Allen 2" Extruder; NRM 1½". HYDRAULIC PRESSES: Southwark 36" x 36"; Stewart-Bolling 36" x 36"; French Oil Mill and Dunning & Boschert Presses 10" and 12" Rams.
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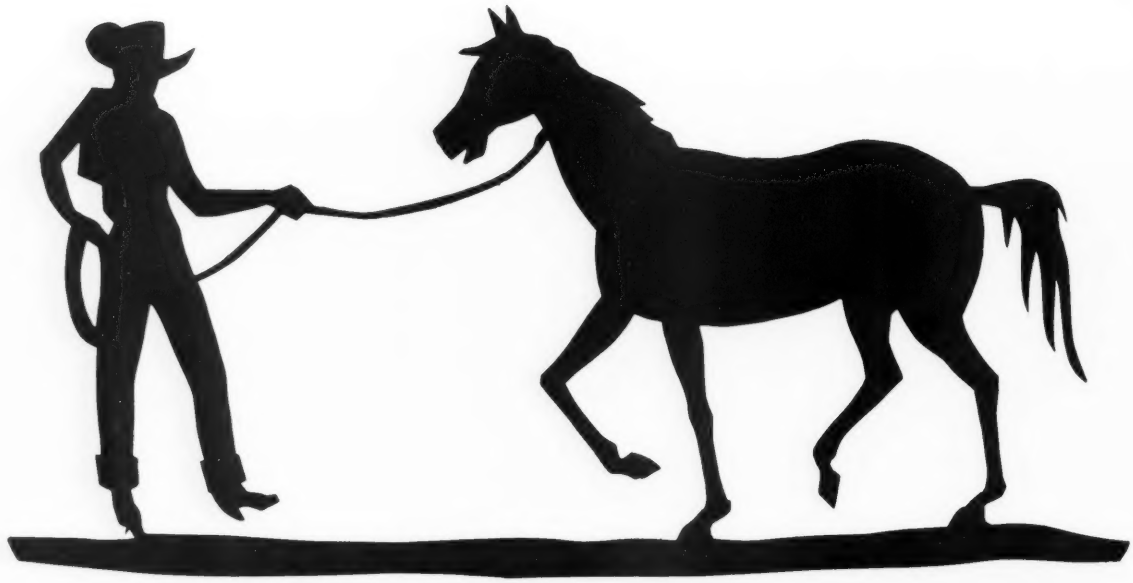

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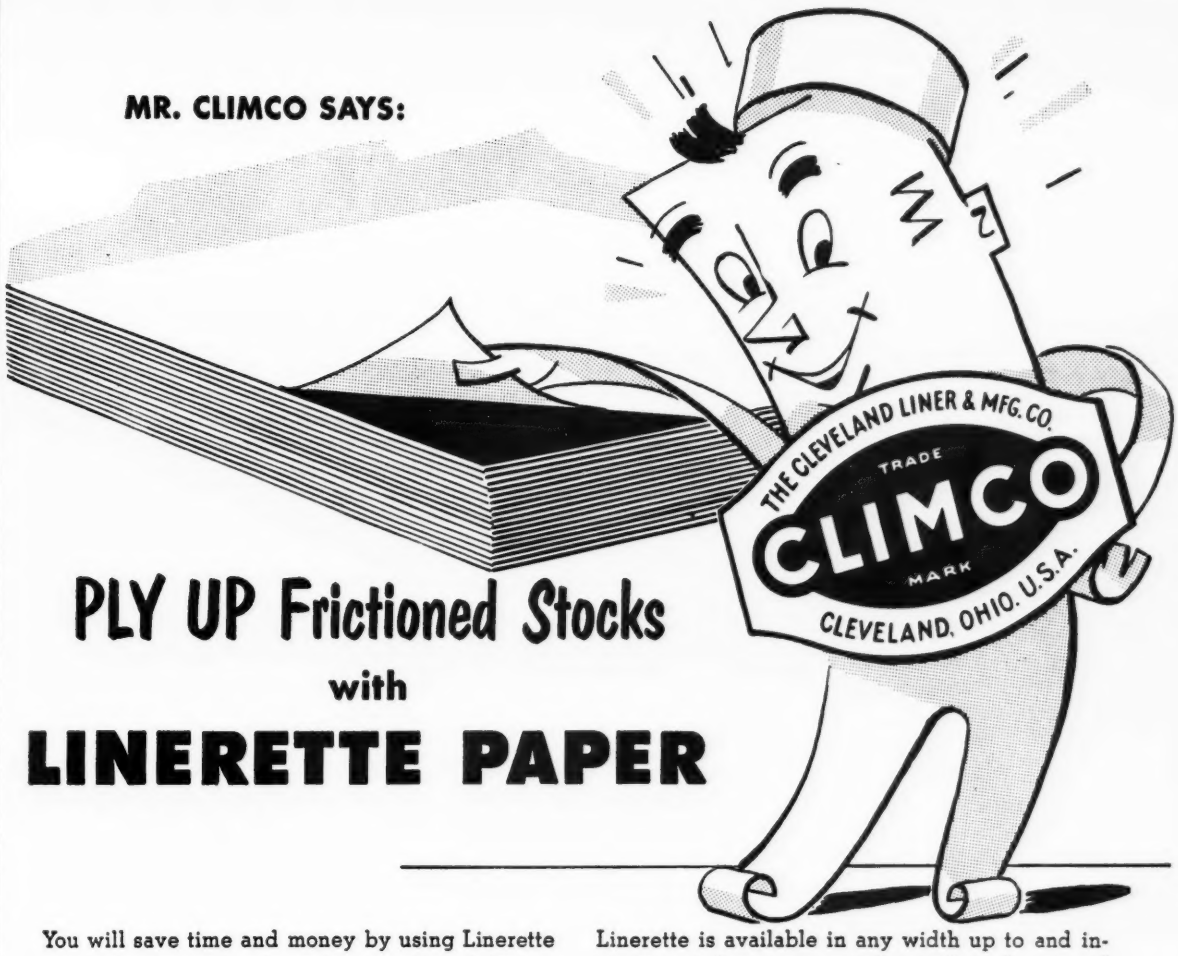

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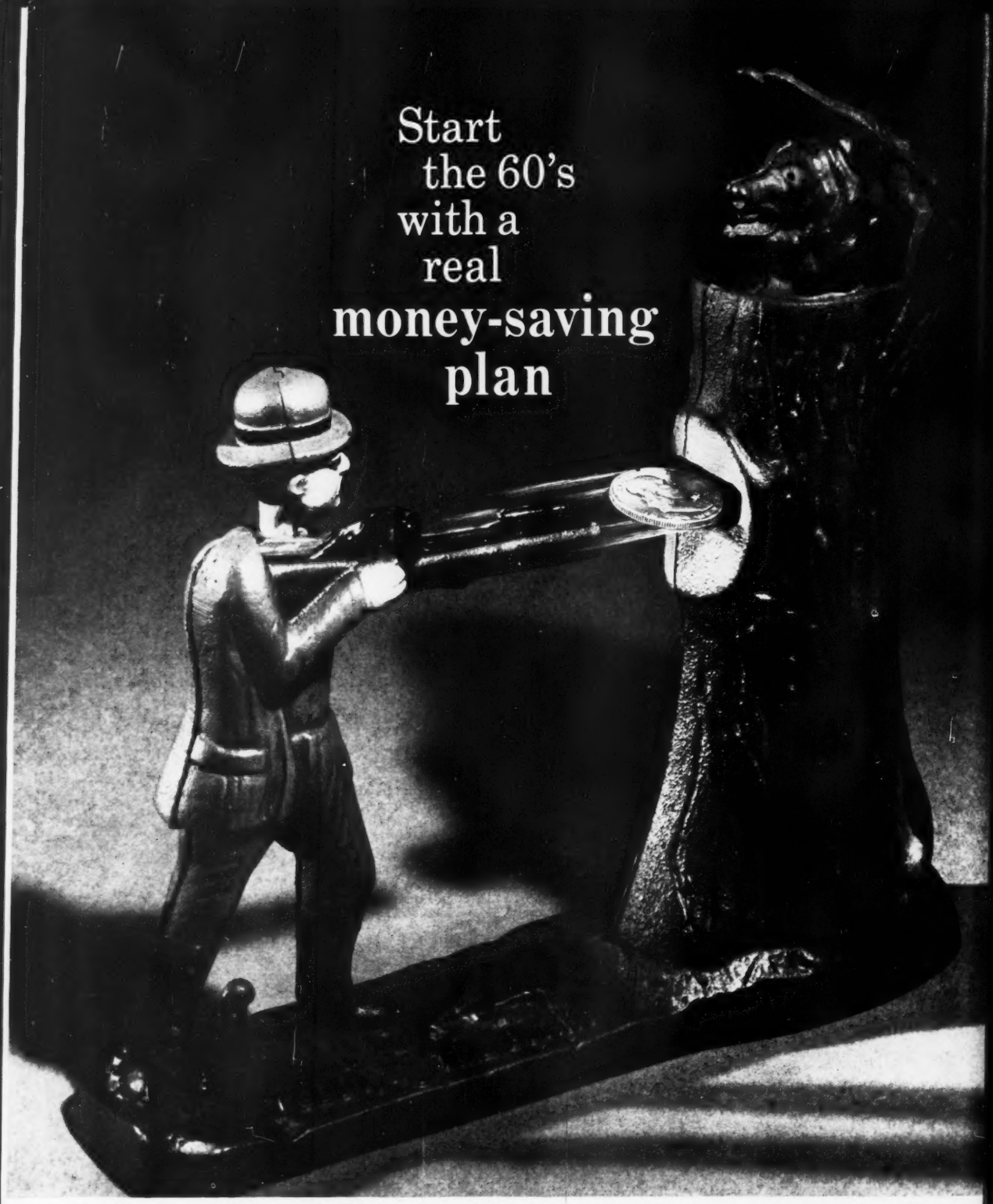

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